

JULY 1953

90th Year

# AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING • WARM AIR HEATING • SHEET METAL CONTRACTING

## Cover Picture

**SHEET METAL** columns of stainless steel add beauty to bank lobby. Details of fabrication are outlined . . . . page 56

**EVAPORATIVE COOLING** fundamentals are explained in new series . . . . . page 58

**PERIMETER HEATING** FOR a two story church . . . page 68

**HOW FIELD MANAGEMENT** can cut expenses on a housing project . . . . . page 100

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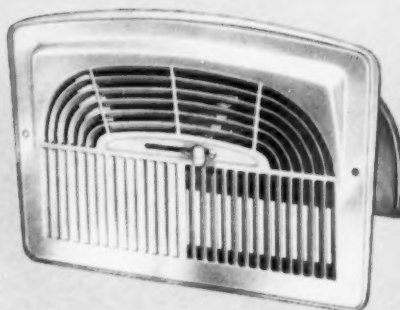


# #15 SIDEWALL PERIMETER DIFFUSER FOR RESIDENTIAL HEATING-COOLING SYSTEMS

RIGHT\* FOR SUMMER COOLING.

RIGHT\* FOR WINTER HEATING.

\* Conforms to latest data from  
National Association Research  
Project.



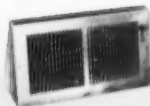
STYLED TO PLEASE THE EYE • ENGINEERED FOR UTMOST EFFICIENCY



- 1 LOWEST RESISTANCE** — The curved damper valve, curved center vane and the exclusive Air Control face design combine to give the lowest possible resistance factor. The No. 15 Sidewall Perimeter Diffuser is the perfect complement to the well designed heating-cooling plant for all types of homes.
- 2 EASY, POSITIVE BALANCING** — Only Air Control gives you the Adjusto-Stop to allow for accurate, positive balancing of the system at the diffuser face. In just minutes, you can set the system for summer or winter air delivery . . . a must in combination systems which require a change in air volume twice each year.
- 3 SPRING-TYPE OPERATOR** — The flat spring linkage from the control to the curved damper valve will not rattle . . . will not creep. It is your assurance that the system will stay balanced as you want it and peak air velocities will not create noise.
- 4 GREATER EFFICIENCY . . . GREATER COVERAGE** — No other diffuser gives as much coverage-per-opening as the No. 15 by Air Control. This one diffuser will blanket the average wall . . . up to 8' x 14' . . . from one opening. Think of the savings in time, material and labor that this will mean on each and every job!

'E' Frame available to adapt No. 15 Perimeter Diffuser for base-board installations.

## PLUS A COMPLETE LINE OF REGISTERS, GRILLES AND DIFFUSERS



**No. 16S PERIMETER BASE-BOARD REGISTERS.**  
Ideal for out-of-the-wall installations with black or painted concrete construction where cutting is impractical. A truly economical unit with Adjusto-Stop damper. Cut costs, allows easy balancing.



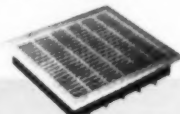
**No. 42 PERIMETER DIFFUSER.**  
Here is the Diffuser for any perimeter floor installation. It is long and narrow with heavy vanes to give the desired spread and rise over exposed walls and picture windows. Vanes are adjustable to allow complete control of pattern. Set-screw damper adjustment for volume control.



**CEILING DIFFUSERS.**  
Flush mounted or step-down models for smooth good looks and utmost efficiency. Air flow rings present minimum resistance, allow rapid air diffusion. Dampers, installation rings and drop rings also available.



**No. 10 SERIES.**  
For sidewall and baseboard air conditioning systems. Four styles combining adjustable vertical and horizontal fins for complete control. Satin beige finish can be painted to match the wall. Metal-licent finish also available.



**No. 40 SERIES.**  
Floor registers and return air faces. Patented Rigid-Lock construction is strong and solid, makes a firm level walking surface for home or commercial installations. Foot-operated dial controls air flow.

SEE YOUR LOCAL JOBBER OR WRITE FOR THE AIR CONTROL CATALOG TODAY



Also manufacturers of  
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convenience features  
for inside and  
outside the home.  
Catalog available  
on request.

BE SURE OF BETTER FINISHED INSTALLATIONS. BE SURE OF QUALITY AND LOW COST. STANDARDIZE ON AIR CONTROL FOR EVERY JOB.

## AIR CONTROL PRODUCTS, INC.

DEPT. A COOPERSVILLE, MICHIGAN



# MODERN AS TOMORROW

## CENTURY'S *NEW* HORIZONTAL UNITS

**CENTURY INTRODUCES  
its Latest Addition to  
an Already Broad Line  
Four Sizes, Oil**



A WORLD OF POTENTIAL — New and remodeled gas stations, shops, stores, etc. make up a BIG heating market. But much of this market makes a specific demand — a demand for overhead heating installations.

Heating contractors who can meet this special demand are getting plenty of extra business! Century's new oil-fired Horizontal Units give you what you need to go after this profitable business. Easy to install, singly or in batteries. Cost is low; operation economical.

A SECOND BIG POTENTIAL—Owners of homes without basement or utility room want central heating, too. New Century Horizontal Units were designed for such requirements. Easily installed in crawl space; front access to burner, blower and flue. Can be installed overhead in basement to save floor space.

FOUR SIZES — Bonnet output ratings of 85, 105, 135 and 160 thousand BTU. All sizes feature the famous, trouble-free Century oil burner — gives plenty of heat at LOW fuel cost. Units shipped completely assembled.

Century Engineering Corp., Cedar Rapids, Iowa

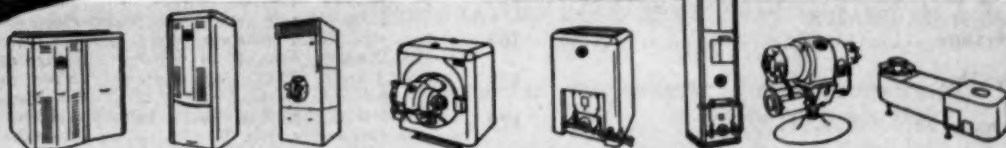
Advertised in Leading  
Home Magazines

# Century

### — WRITE FOR DETAILS NOW —

CENTURY ENGINEERING CORP. 404 3rd St. S.E., Cedar Rapids, Iowa  
Please send me details on your new oil-fired horizontal units.

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_



**SELL CENTURY — A COMPLETE LINE MEANS MORE JOBS AND PROFITS!**

# AMERICAN ARTISAN

**JULY 1953**

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Founded 1864

Volume 90 No. 7

**RESIDENTIAL  
AIR CONDITIONING**

**WARM AIR HEATING**

**SHEET METAL CONTRACTING**

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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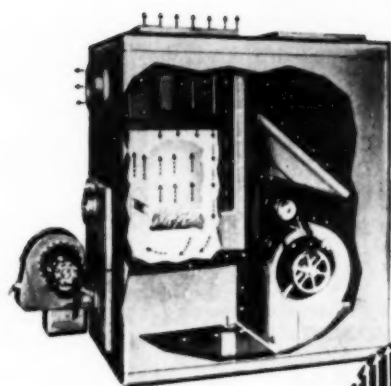
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# *Syncromatic*

*Means Peak Efficiency*

FROM  
70,000 Btu's.

*Gas*



500 SERIES  
OIL or GAS FIRED  
LO-BOY - COUNTERFLOW - HI-BOY

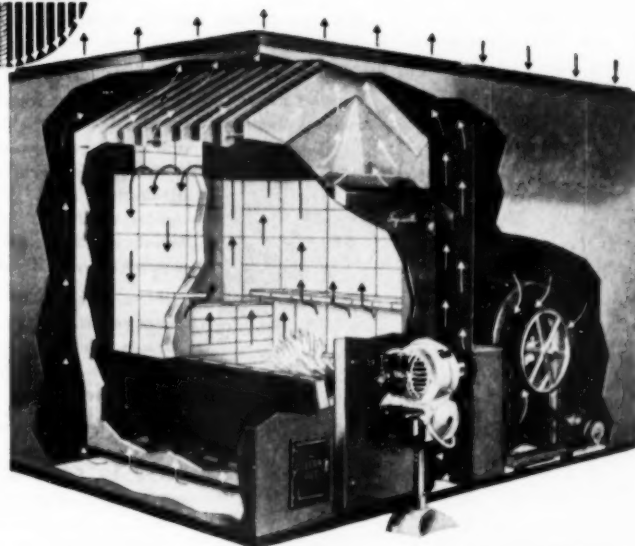


*With*

TO  
1,000,000 Btu's.

FROM THE SMALLEST HOME  
UNIT TO THE LARGEST  
COMMERCIAL FURNACE  
YOU GET THE SAME MATCH-  
LESS QUALITY

1. Unequaled counterflow heat transfer design.
2. Heavy gauge long lived heat exchanger.
3. High combustion efficiency with all fuels.
4. Quiet operation.
5. Superbly designed furnace casing.
6. The best materials money can buy.



HI-CAP SERIES  
OIL - GAS or COAL FIRED

BY MAINTAINING THESE QUALITIES IN EVERY FURNACE BUILT, SYNCROMATIC HAS SET A STANDARD IN WARM AIR HEATING EQUIPMENT THAT IS HARD TO EQUAL.

FOR COMPLETE INFORMATION SEE YOUR NEAREST SYNCROMATIC WHOLESALER OR WRITE  
SYNCROMATIC CORPORATION  
WATERTOWN, WISCONSIN.

## the editor's notebook

### Gas Incinerators Proving Popular

MORE THAN 500,000 homes are currently using gas fired incinerators operating at a cost of about 2 to 3 cents a day, according to the American Gas Association. The number of gas incinerator manufacturers has grown from six in January, 1951, to 19 this year.

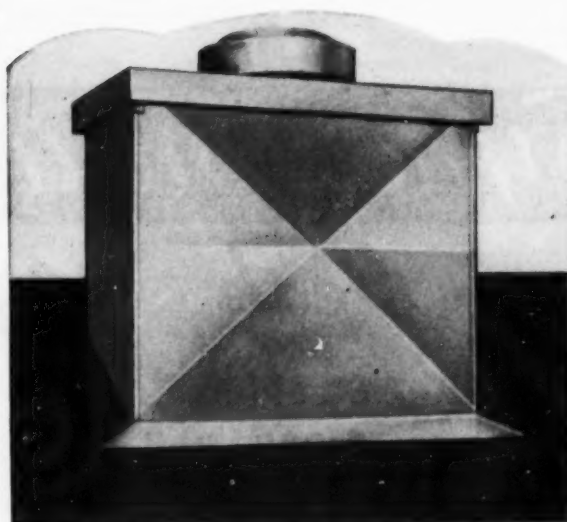
### OHI Group Promotes Drive for Manpower

A 3 x 5 CARD is being distributed by members of Oil-Heat Association of Maryland. It reads on one side: "How would you like to have your son strike it rich in oil?" On the other side is stated: "Five courses are available for well trained young men in the oil heating industry." The following facts are listed: a) 170,000 homes are being served in the Baltimore area. b) 100 well established firms are seeking men. c) Starting in September, a new technical high school will offer a course for oil burner technicians. The student receives a high school diploma plus training for a well paying position.

This is part of the Maryland association's training and recruiting program designed to bring manpower to the oil heating industry.

### Defense Houses Con- structed as Scheduled

FIFTY-FOUR per cent of the defense houses programmed for private construction in critical defense housing areas had been put under construction and 39 per cent of those programmed had been completed as of May 20, 1953, according to a recent report on the progress of defense housing received from the Housing and Home Finance Agency.

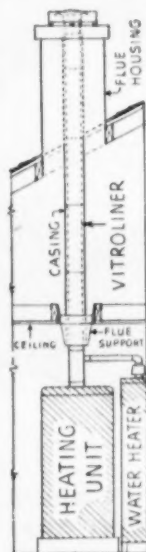


## A NEW FEATURE IN

# the Pioneer Vitroliner prefabricated Chimney

The New Deluxe Housing for the regular Vitroliner Chimney is designed to harmonize with the architectural lines of the more elaborate and larger ranch houses and buildings.

Leading project home builders and single contractors prefer Vitroliner Chimneys because they are lightweight, easy to install and save approximately half the cost of masonry construction. Savings on the installation alone make Vitroliner the highest quality chimney available at the lowest installed price. You can quote competitive prices and make more profit!



Home owners prefer these modern chimneys because they save valuable floor space in the home, — have an attractive appearance and require practically no maintenance.

VITROLINER CHIMNEYS are tried and proven successful for over ten years. Approved by F.H.A. and listed by Underwriters Laboratories for ALL fuels.

- Lowest installation time
- Taller made to fit
- Highest quality at lowest price
- High heating equipment efficiency
- Provides attic ventilation
- M.F.D. in 6", 7", 8" and 10" Dia.
- Available in any quantity

Investigate this fast selling modern chimney. Write for circular today.

## CONDENSATION

ENGINEERING CORPORATION  
3511 W. POTOMAC AVE., CHICAGO 51, ILL.

## the editor's notebook

(continued)

### Air Conditioning Becoming a Necessity

THE AVERAGE WORKER will sleep, eat, work, commute and play in an air conditioned atmosphere within the next decade, according to D. C. Minard, president, The Trane Co.

Air conditioning is shifting rapidly from a luxury to a necessity in new residential building as well as in commercial and amusement building, Mr. Minard told 78 field sales engineers who attended a recent four-day refresher course.

New product developments, production-engineering economies, rising public demand and increasing competition are four important factors working to broaden the market for air conditioning, Mr. Minard said.

### Sees 300 Per Cent Rise in Conditioned Homes

AN INCREASE this year of 300 per cent in the number of new fully air conditioned homes was forecast recently by Cloud Wampler, president, Carrier Corp., speaking at ceremonies honoring the winners in the company's nation-wide competition among architects for the best designs for air conditioned homes.

The national grand prize of \$5000 was awarded jointly to Eduardo Fernando Catalano and Horacio Caminos, professors at the architectural school of North Carolina State College, Raleigh, for their winning submission, judged the best of 861 entries.

"Our decision to offer prizes in this competition was prompted by a desire to stimulate interest on the part of architects so that they might be even better equipped to cope with the rapidly growing demand for homes in-





## GETTING YOUR SLICE of the HEATING MARKET?

Many of today's alert businessmen are joining the ever-growing family of Waterbury dealers and distributors. Waterbury dealers enjoy, and profit from, reputations that only quality heating equipment, expertly installed, can successfully build and maintain. Equally as important, Waterbury maintains a sound dealer-distributor-factory policy, a policy which assures a profitable future for every Waterbury dealer.

### *Waterbury* *furnaces* AIR CONDITIONERS

If you're not already acquainted with the complete Waterbury line, now is the time to find out about Waterbury's place in your future. Association with Waterbury is good business.



*"It's what's under  
the casing that  
counts!"*

## The Waterman-Waterbury Co.

OVER 16 YEARS OF WARM AIR HEATING

1122 JACKSON ST. N. E. MINNEAPOLIS 13, MINNESOTA

## the editor's notebook

(continued)

corporating year 'round conditioning," Mr. Wampler said.

He pointed out that in 1952, about 15,000 new homes, or 1.5 per cent of the total constructed in the United States, were equipped with year 'round air conditioning. This year, recent data indicates that the total number of air conditioned homes should approximate 60,000 or 6 per cent of all homes built — a gain of 300 per cent in a single 12 month period. "It now seems highly probable," he said "that in five years, assuming favorable business conditions, we will find that one out of every two homes being built will be constructed for year 'round air conditioning."

According to Mr. Wampler, some 750,000 room air conditioners may be sold by the industry this year, an increase of 82 per cent over the number sold last year. "Those who purchase units for single rooms," he said, "will quickly realize the many benefits of air conditioning and will, I believe, become among the best future customers for complete home units that will heat in winter and cool and dehumidify in summer." As a result, he feels that by 1958 the dollar volume of sales of year-round residential units will catch up with and thereafter exceed that of room air conditioners for homes.

### U.S. Government Buys Canadian Metal

THE INTERNATIONAL Nickel Company of Canada, Ltd., has signed a contract under which the United States government has purchased for quick delivery a total of 120 million lb of metallic nickel and 100 million lb of electrolytic copper. The contract is with the Defense Materials Procurement Agency.



**IF**  
you can find  
a cubbyhole in a house —  
you can sell a



The SUN line of oil- and gas-fired automatic furnaces includes a wide range of sizes and capacities — from the large industrial installation of 224,000 Btu down to the pint-size HI-BOY that will fit into any closet or cubbyhole. The tiniest home is a prospect for the compact, space-saving HI-BOY.

The SUN line is backed by over 50 years of experience in furnace design and manufacture so when you install a SUN FUEL-MASTER you know you are delivering the utmost in heating satisfaction and long life.

P. S. If you haven't seen the latest



ask for full details.



## the editor's notebook

(continued)

Deliveries under the new contract, the company said, will not require diversion of nickel from that which is currently being supplied to the nickel trade from its regular production. Instead, larger quantities of nickel will be available for all purposes.

### Furnace Shipments in First Quarter

According to Bureau of Census figures, the total of warm air gravity units shipped in the first quarter of 1953 was 25,061, of which 10,146, or 40 per cent, were coal-fired; 2685, or 11 per cent, oil-fired; and 12,230, or 49 per cent, gas-fired. This compares with a 1952 total first quarter figure of 26,469, 45 per cent of which were coal-fired; 11 per cent, oil-fired; and 44 per cent, gas-fired.

Winter air conditioning units shipped during the first quarter of 1953 totaled 151,506. Of these 2013, or 2 per cent, were coal-fired; 64,422, or 45 per cent, were oil-fired; and 81,071, or 53 per cent were gas-fired. Total for the first quarter of 1952 was 123,296. Of these 2 per cent were coal-fired; 47 per cent, oil-fired; and 51 per cent, gas-fired.

The total of both gravity and winter air conditioning units shipped in the first quarter of 1953 was 176,567, compared to 149,765 shipped during the first quarter of 1952. Of these, for the first quarter of 1953, 25,061, or 14 per cent, were gravity furnaces and 151,506, or 86 per cent, were winter air conditioning units, as compared with 26,469, or 18 per cent, gravity units in the first quarter of 1952 and 123,296, or 82 per cent, air conditioning units.

You can't be too SMALL



and you'll never grow too BIG



for

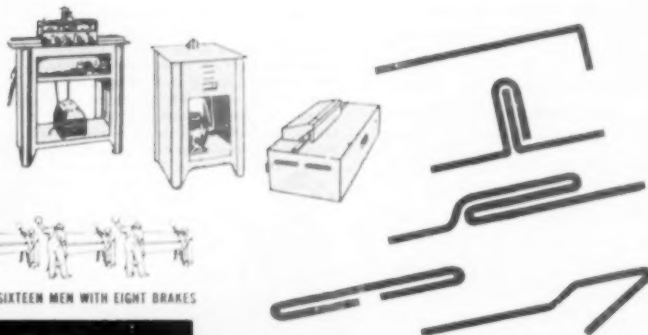
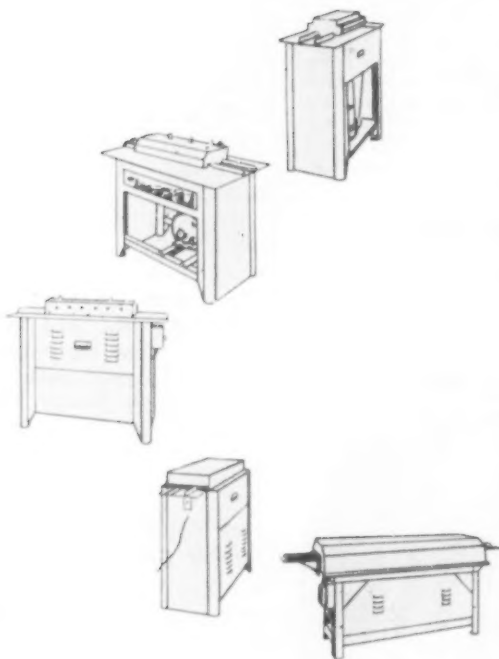
# LOCKFORMER

## FABRICATION!

No sheet metal shop, regardless of size, can compete with Lockformer fabrication unless it, too, has automatic lock-rolling equipment. *One* man and a Lockformer, for instance, makes more Pittsburgh Locks than *sixteen* men with eight brakes. No shop can afford to work under that kind of a handicap.

On the other hand, no shop, regardless of size, can "top" Lockformer efficiency. No matter how much you're willing to pay, you can't buy a "better" machine for the simple reason that there just isn't any such equipment.

IF YOUR SHOP makes ducts, you need a Lockformer . . . NOW! You'll find your Lockformer a consistent money-maker ALWAYS!



ONE MAN WITH A LOCKFORMER MAKES MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE **LOCKFORMER** CO.

4615 WEST ROOSEVELT ROAD • CHICAGO 30, ILLINOIS

## the editor's notebook

(continued)

### Ship More Fans and Blowers

SHIPMENTS of fans, blowers, and related equipment, except positive displacement blowers and turbo-blowers, in the first quarter of 1953, were valued at \$37.6 million, an increase of 17 per cent over the corresponding value of shipments reported for the preceding quarter, according to the Bureau of the Census, Department of Commerce. This change was accounted for chiefly by shipments of propeller fans, which increased from \$7.5 million in the fourth quarter 1952 to \$14.4 million in the first quarter 1953. The value of orders booked during the first quarter amounted to \$38.6 million, an increase over the preceding quarter of 17 per cent. Shipments and orders booked for positive displacement blowers and turbo-blowers in the first quarter of 1953 were valued at \$4.7 million and \$3.2 million, respectively.

Shipments of unit heaters and related equipment in the first quarter amounted to \$11.9 million, a decrease of 24 per cent from shipments of \$15.7 million in the fourth quarter of 1952. The value of orders booked during the first quarter was \$12.2 million, down 26 per cent from the \$16.6 million reported for the preceding quarter.

Shipments of fans, blowers, unit heaters, and accessory equipment during 1952 totaled \$194 million, a slight increase over shipments of \$186 million in 1951. Of the 1952 total, the fan and blower group of products accounted for \$139 million; the unit heater group, \$53 million; and air washers, \$1.2 million. Orders booked for all items combined amounted to \$194 million in 1952, a

HERE THEY ARE...SENTRY'S TWO NEWEST ADDITIONS TO THEIR EVER-POPULAR

## AT-A-GLANCE

(DIRECT AND REMOTE)

## TANK GAUGES

### THERMA-GAUGE

A superior quality, precision instrument with full view, solid red thermometer-type indicator

Without question, here is the easiest to read, accurate measure gauge on the market—And, the easiest to install, whether tank is empty, full or partially full. Unit features zinc base metal, two-piece die-cast assembly — Unbreakable red plastic assembly nut — Calibration chart, sealed between heavy, heat-resistant plastic domes — Brass rivets — And, a double coated cork float that's impervious to oil, many chemicals and acids. No gears, magnets, cams or tapes. Guaranteed to withstand in excess of 70 lbs. pressure per sq. inch. Tailor-made to fit individual tanks up to 12 ft. deep. Calibrated and factory adjusted.

**QUICKLY, SIMPLY INSTALLED.** Illus. at left shows how entire calibration and float assembly may be inserted and positioned after two piece die-cast tank plug has easily been installed in tank — only an ordinary wrench is needed.



## SENTR-ECON

A new, durable, low cost instrument for economy installations.

Exceptionally high quality for such a competitively priced gauge. Features patented double dome with calibrations positioned between inner tube and outer heat-resistant plastic shell. Also, die-cast tank fitting — plated metals — brass rivets. No gears, magnets, cams or intricate mechanisms. Double coated cork float is impervious to oils, most chemicals and acids. Simple to install, even in partially-filled tanks. 1½" openings only. Factory calibrated and adjusted to insure accuracy.



**KRUEGER SENTRY GAUGES**  
GREEN BAY • WISCONSIN

## the editor's notebook

(continued)

slight decrease from orders booked valued at \$202 million in 1951.

### Heating Fuels Compared for 16 Cities

THE CONSOLIDATED Consumer Analysis for 1953, made up of data gathered by 17 newspapers, presents the following comparative figures on heating fuels used by home owners in 16 U. S. cities:

	Gas	Oil	Coal
Cincinnati	57.0	6.6	35.1
Columbus	61.5	2.3	33.2
Duluth-			
Superior	6.4	45.2	48.4
Fresno	92.3	3.1	—
Indianapolis	6.7	39.8	52.5
Long Beach	98.5	0.7	0.1
Milwaukee	21.9	31.1	47.0
Modesto	96.1	1.1	—
Omaha	47.8	30.0	21.9
Portland, Me.	4.3	66.7	27.8
Sacramento	95.8	2.1	—
St. Paul	24.4	55.4	19.7
Salt Lake			
City	71.5	5.2	23.2
San Jose	96.5	1.3	2.2
Seattle	4.3	81.0	13.3
Washington,			
D. C.	30.4	37.4	21.7

[In each case, the percentage which would make up the difference between the total given and 100 per cent represents "other" (unspecified) fuels.]

### New Construction Up 10 Per Cent in May

NEW CONSTRUCTION expenditures rose 10 per cent during May to \$2.9 billion, and were 6 per cent above May 1952, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics and the Building Materials Division of the U. S. Department of Commerce. Although most of the April-May rise occurred in private residential construction and road building, adverse weather kept these types of work from ris-



THE WINTER AIR CONDITIONER WITH THE

# Flame that Tunes Itself

Here's the only furnace on the market with a modulating burner... a burner that tunes its flame continuously to the slightest change in return-air temperature.

Three exclusive components make this possible, to provide "LIVING-LEVEL" HEATING.

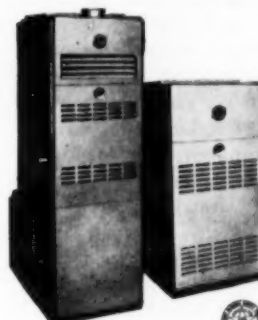
1) "Magic-Heet" Control accurately measures the rate of heat loss and continuously adjusts gas input.

2) *Modu-flame* Burner provides the exact amount of heat required. 3) *Duo-Level Blower Control* varies filtered air flow with heat input. These provide the CONTINUOUS COMFORT every homeowner desires.

For full information, write A. O. Smith Corporation, Permaglas-Heating Division, Dept. AA-753, Kankakee, Illinois.

## Self Modulating

A. O. SMITH WINTER  
AIR CONDITIONER



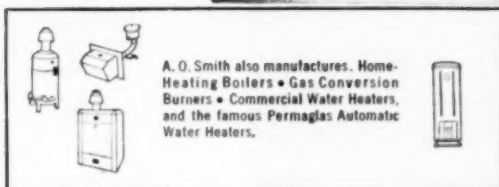
High-Boy and Low-Boy Models  
100,000 B.T.U. input are approved by AGA for modulation.



# A.O. Smith

PERMAGLAS-HEATING PRODUCTS

SALES: Atlanta • Chicago 4 • Dallas 2 • Denver 2 • Detroit 31  
Houston 21 • Los Angeles 22 • Midland 5, Texas • Milwaukee 8  
New York 17 • Philadelphia 3 • Pittsburgh 19 • San Francisco 4  
Seattle 1 • Springfield, Mass. • Washington 6, D.C.  
SERVICE: Chicago 17 • Dallas 1 • Los Angeles 12 • Union, N. J.  
International Division: Milwaukee 1  
In Canada: John Inglis Co., Ltd., Toronto



A. O. Smith also manufactures. Home-Heating Boilers • Gas Conversion Burners • Commercial Water Heaters, and the famous Permaglas Automatic Water Heaters.

## the editor's notebook

(continued)

ing as much as usual in May. Total private expenditures were up 8 per cent from April to almost \$2 billion in May, and public outlays rose 13 per cent to \$933 million.

New construction activity as a whole totaled a record \$12.6 billion for the five months, January-May 1953, almost 6 per cent above the 1952 figure for the same months. Private construction, with a value of \$8.7 billion, accounted for nearly the entire gain over last year, largely from increased outlays for new dwelling units and commercial building. Public expenditures totaling \$3.8 billion were but slightly above the January-May 1952 total, as lowered activity on public housing, hospitals, and Federal reclamation and development work offset the moderate gains for most other types of public construction.

Private spending for residential building advanced almost 9 per cent during May to \$987 million, and was 7 per cent above the May 1952 estimate. Despite a rainy spring, total expenditures thus far in 1953 for new work on private residential building amounted to more than \$4.3 billion — almost 9 per cent above the January-May 1952 total. Non-house-keeping residential building (including motels, hotels and dormitories) showed significant increases over the year; outlays of almost \$100 million were 56 per cent more than in 1952 for the first five months.

### Human Nose — the Best Smell Analyzer

JOHN VON BERGEN, executive of Airkem, Inc., odor control specialists, told the Air Pollution Control Association at its recent meeting in Baltimore about research into the mysteries of smell, his com-



## A TRADEMARK WITH FIRE IN ITS EYE

Here's a trademark symbolizing all that's inherent in dependable, efficient heating — an eternal flame emblematic of the continual search for new methods to produce more and better heat at lower cost. It's the trademark of The Nu-Way Corporation, Pioneers in the design and manufacture of economical oil burners . . . exclusive manufacturers of oil burners for 32 years. It's the trademark that means integrity and dependability in all business associations and in oil burner performance. Each year more and more Nu-Way burners are sold by jobbers, by dealers and as a part of products of leading furnace and boiler manufacturers.



## the editor's notebook

(continued)

pany's classification of some 4000 different odors, and the researchers' final conclusion that the most sensitive scientific instrument for detecting, identifying and analyzing odors is the human nose.

He discussed the way in which certain odors can counteract each other. When two odors are mixed in the correct proportions, the mixture of odors seems to have no effect whatsoever on the olfactory apparatus of the nose, and therefore the "smell" disappears. This can be done, he explained, without using any desensitizers.

The control of industrial odors, Mr. von Bergen said, makes it possible for industrial firms to maintain good will among property owners near their plants as well as to provide better working conditions for employees.

### Predicts Increased Use of Gas Air Conditioning

JOHN A. GILBREATH, assistant vice president for air conditioning, Servel, Inc., at the recent Eastern Natural Gas Regional Sales Conference, urged that air conditioning needs be given the same priority as that now granted to cooking and water heating needs.

He urged his hearers to stop assuming that the day when millions of homes will have air conditioning is off in the dim future. Of his own company, which intends this year to make one-third as many year 'round air conditioners as the whole industry produced in 1952, he said:

"After the consumer phase of our advertising campaign broke in seven magazines, inquiries at the rate of 1000 a day reached us for two weeks. Hundreds of those people will buy air conditioning — are in fact buying it now."

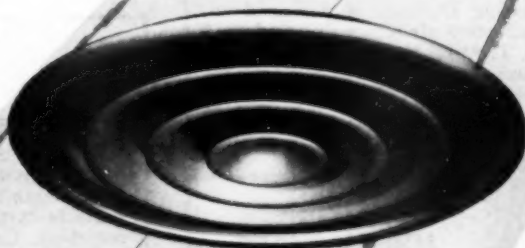
# Like in a pod...

... all diffuser types in the new Aerofuse Type 'P' Series are identical in appearance with beautifully styled matching facial contours and the same number of rings. This outstanding feature insures uniformity when more than one type—or more than one size—is installed in a conditioned area.

Engineered to meet the most rigid specifications of efficient, satisfactory performance, each diffuser type in the new Aerofuse line is designed for a specific air delivery job. For an installation that is right, both in appearance and performance, specify Aerofuse at the vital point of air delivery.



**Type PA**  
Adjustable Pattern Diffuser



**Type PS**  
Stepped-Down, Fixed Pattern Diffuser



**Type PF**  
Flush, Fixed Pattern Diffuser



**Type PR**  
Flush, Supply and Return Diffuser

Write for copy of Catalog No. 105... complete information, selection charts, engineering data.



**TUTTLE & BAILEY inc**  
NEW BRITAIN, CONNECTICUT

# The Right Register—

FOR EACH OF YOUR SMALL PIPE INSTALLATIONS

BY **Char-Gale**

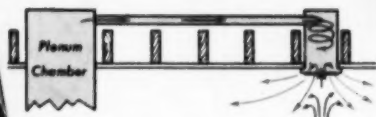


Diagram of typical Char-Gale "Gale-Aire" Ceiling Diffuser Installation.

A circular outward thrust imparted to the air entering the register box, produces a partial vacuum in the center of the cylinder. Room air is drawn up into the box and blended with the heated air to provide a gentle, effective warming action.

## "GALE-AIRE" CEILING DIFFUSER

Newest Char-Gale register, the "Gale-Aire" Ceiling Diffuser is designed to provide effective air tempering and distribution. The unit includes a cylindrical box, fitting ring, foam rubber gasket, and register.



## "GALE-AIRE" BASEBOARD REGISTER

Including all the features of the Sidewall Register, the "Gale-Aire" Angle Baseboard Register is designed especially for older homes. It is installed through a floor opening, with no wall cuts needed.



## "GALE-AIRE" SIDEWALL REGISTER

The "Gale-Aire" Sidewall Register distributes air evenly in all directions along the wall. Adjustable, it permits complete balancing at the registers. Complete with register, box and a foam rubber gasket.



## "GALE-AIRE" FLOOR DIFFUSER

Answers the need for an inexpensive method of distributing air along outside walls. Vanes set at proper angles to achieve a fan-shaped diffusion pattern.



### Remember:

Char-Gale provides everything from plenum to register in the "Gale-Aire" System. Also a complete line of registers and fittings for your conventional installations.

Contact your jobber or write us direct

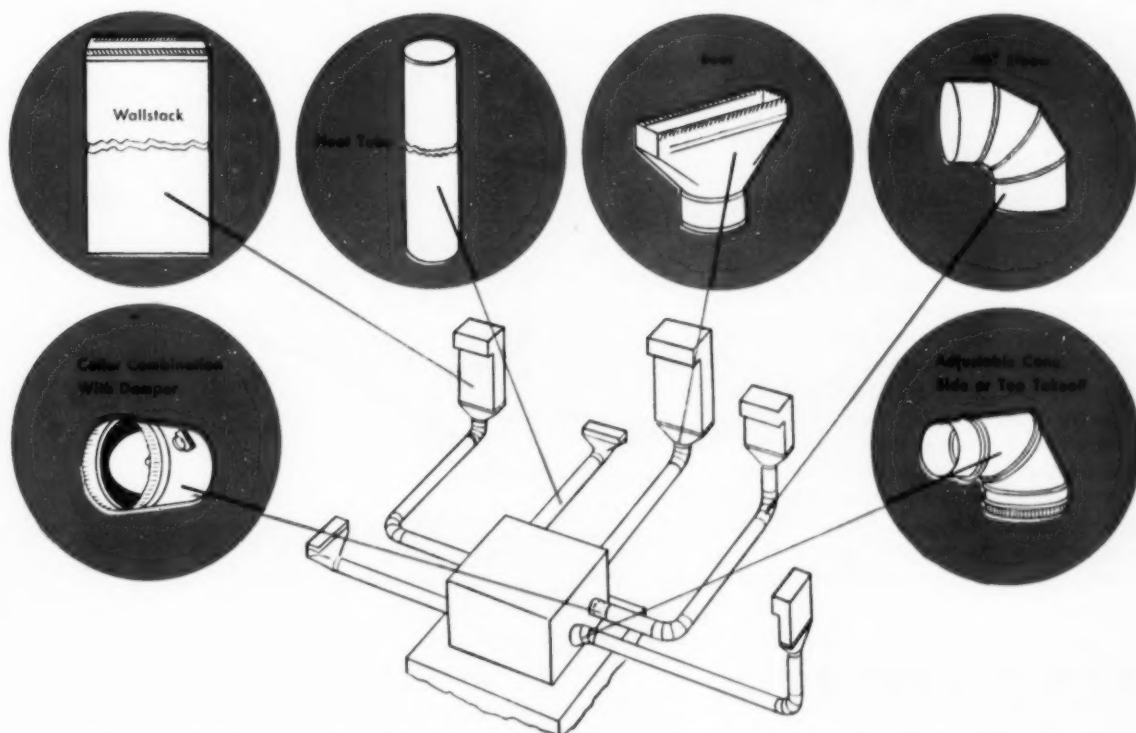
# CHAR-GALE MANUFACTURING COMPANY

MINNEAPOLIS-MINNESOTA



# ALUMINUM PREFABRICATED FITTINGS

*offer Economy and Efficiency  
in Modern Heating Systems*



Aluminum fittings in small pipe heating systems like those so aptly pioneered by the Char-Gale Manufacturing Company, Minneapolis, Minnesota, offer important savings in money, time and effort. For instance, aluminum has three times the working surface per pound of any other metal you can use. Aluminum is so light it speeds up work—helps you complete more jobs and complete them on schedule. Aluminum saves work because it's so easy to handle that installations can be made without fatigue.

Heating systems employing prefabricated fittings

made of Reynolds Aluminum like those manufactured by Char-Gale, offer customer savings in fuel costs and also assure attractive, eye-appealing installations. Inner surfaces are smooth, assure maximum air delivery, faster heat transmission. Dual insulating qualities of aluminum prevent excessive temperature losses and deaden noise when ducts are properly installed.

For complete information, call the Reynolds Distributor listed under "Aluminum" in your classified telephone directory or write Reynolds Metals Company, 2565 South Third St., Louisville 1, Ky.

"Mister Peepers" returns September 13th on NBC-TV.

## REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND

# General Controls' 1953 Automatic

*The easiest-to-use,  
most complete  
heating control guide  
available to the  
heating industry*

General Controls' new 32 page catalog is a convenient and direct guide to the most comprehensive line of automatic heating controls available to the industry today. Simple, uniform throughout in format, double indexed by type number and by name, Catalog #53H sets forth the applications and specifications of 76 automatic heating controls in simple, concise, easy-to-understand terms. Additional technical information is presented in tabular form, including such items as shipping weights and instructions that expedite ordering and delivery. For your copy phone or write the General Controls Branch Office near you . . . no obligation, of course.

## GENERAL CONTROLS

Glendale, California • Skokie, Illinois

Manufacturers of Automatic Pressure, Temperature, Level and Flow Controls for Heating, Home Appliances, Refrigeration, Industrial and Aircraft Applications.

FACTORY BRANCHES IN 34 PRINCIPAL CITIES

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*Write or  
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**BX-67  
BX-68  
BX-69** gas heating package set

**BX-69 GAS HEATING PACKAGE SET**  
With T-70 Standard Thermostat and Heat Anticipation



All-gas, thermostatic control system. Includes self-operated gas valve, thermostat, pilot generator, 25' wire, and staples. Same as BX-67 Set except for higher voltage pilot generator and thermostat with heat anticipation. Higher millivolt output allows additional controls, such as relays or limit controls and heat anticipation. AGA and UL approved.

**APPLICATION** For all gas-fired heating equipment.

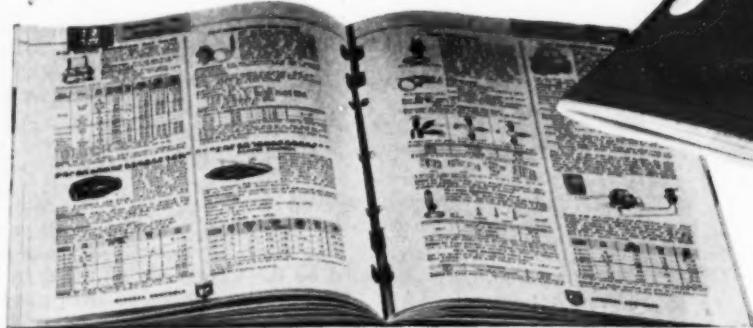
**SPECIFICATIONS**  
Thermostat: T-70 Standard. Night cutoff optional. Range: 50-90°F. Differential: 1½-3°F.  
Valve: B-60. Service, all gases, including LPG and sour gas. Maximum operating pressure, ½ psi.  
Pilot Generator: PG-9 700 millivolt. High current generation. Compact. Removable cartridge. Easy to install. See page 15 for variations.

Size	Weight	Shipping Weight	Shipping Volume	Shipping Class	Price
1/2" NPT	122	2 1/2	88.69K13	88.69K13	\$3.30
3/4" NPT	152	3	88.69K13	88.69K14	
1" NPT	208	3 1/2	88.69K14	88.69K14	
1 1/2" NPT	280	4 1/2	88.69K15	88.69K15	
2" NPT	390	5 1/2	88.69K16	88.69K16	
2 1/2" NPT	1025	8 1/2	88.69K17	88.69K17	
3" NPT	1185	9 1/2	88.69K18	88.69K18	

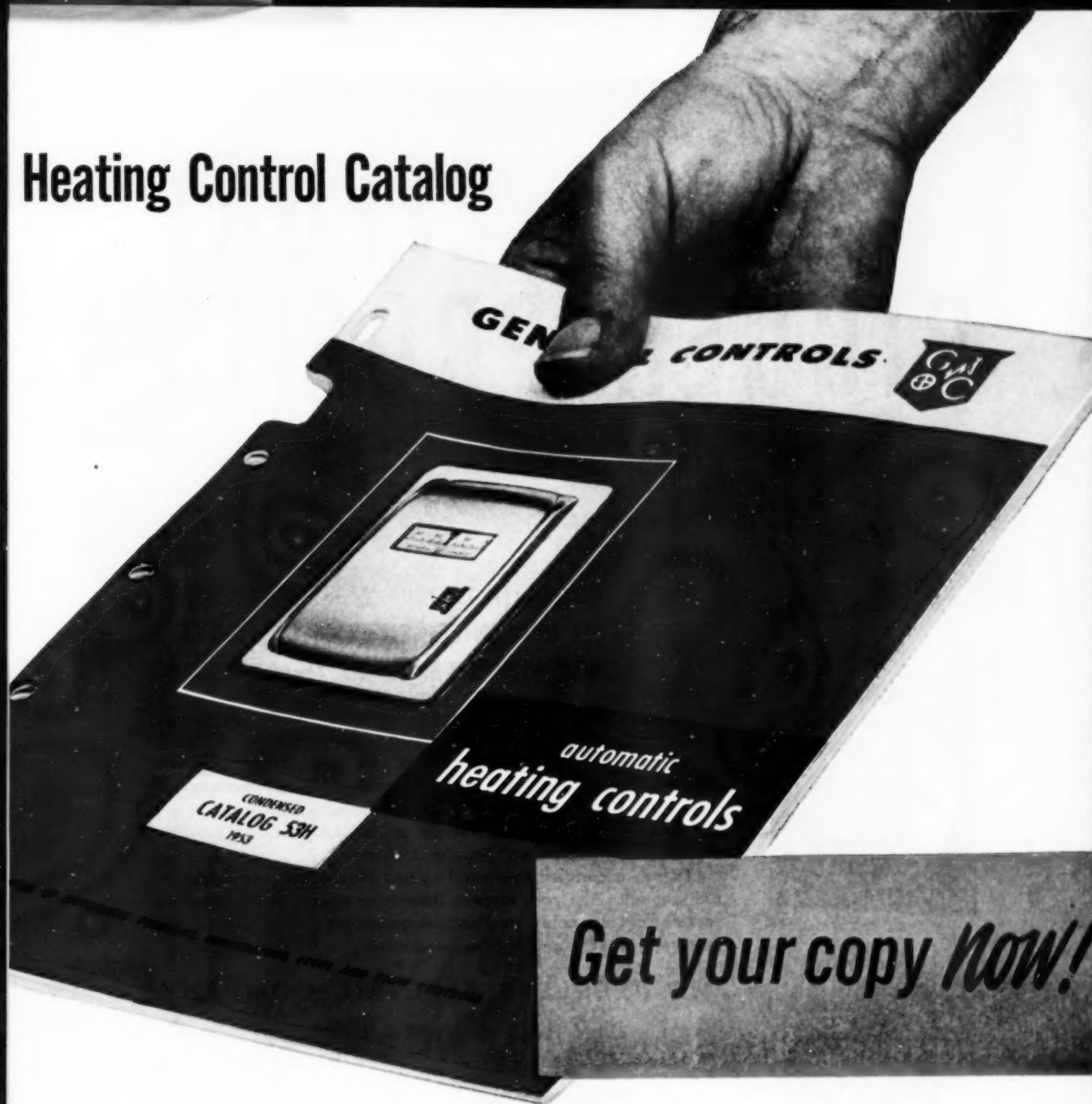
**ORDER BY** Catalog number, gas, ignition type, position.

*use  
application  
range  
ordering*

*Typical page format—clear,  
easy-to-find, information  
arranged in standard form  
as shown above.*



# Heating Control Catalog



**Get your copy NOW!**

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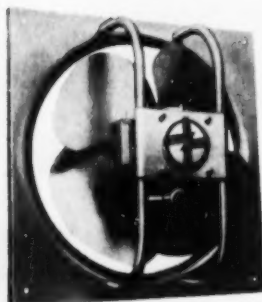
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Please send my copy  
of your latest heating  
catalog #3 H.  
I understand this  
places me under  
no obligation.

# LESS EFFORT BIGGER PROFITS

*install Peerless-built  
fans and blowers*

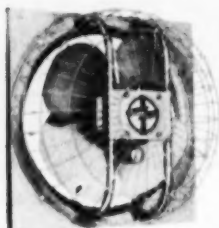
**EASY INSTALLATION—QUIET OPERATION—  
FULL GUARANTEE—SUPPLIED AS COMPLETE  
UNITS WITH JOB-MATCHED *Peerless* MOTORS**



● You combine profit with safety when you recommend Peerless Fans and Blowers.

Peerless Fan and Blower units are compactly designed. They're easy to install and the steady, velvet-smooth performance goes on and on, bringing credit to your selection . . . eliminating the need for costly service calls or the frequent adjustments required with "rattletrap" fans and blowers.

There's a certified Peerless Fan and Blower for every possible requirement. Ask your favorite Distributor about the fast Peerless service and the complete Peerless guarantee. Your inquiry will receive prompt attention from our factory.



Quiet Exhausters with or without inlet guards with 10, 12 or 16-inch fan diameters . . . complete with remote control terminal box and split capacitor motors.



**THE PEERLESS ELECTRIC COMPANY**

**FAN AND BLOWER DIVISION**

1405 WEST MARKET ST. • WARREN, OHIO

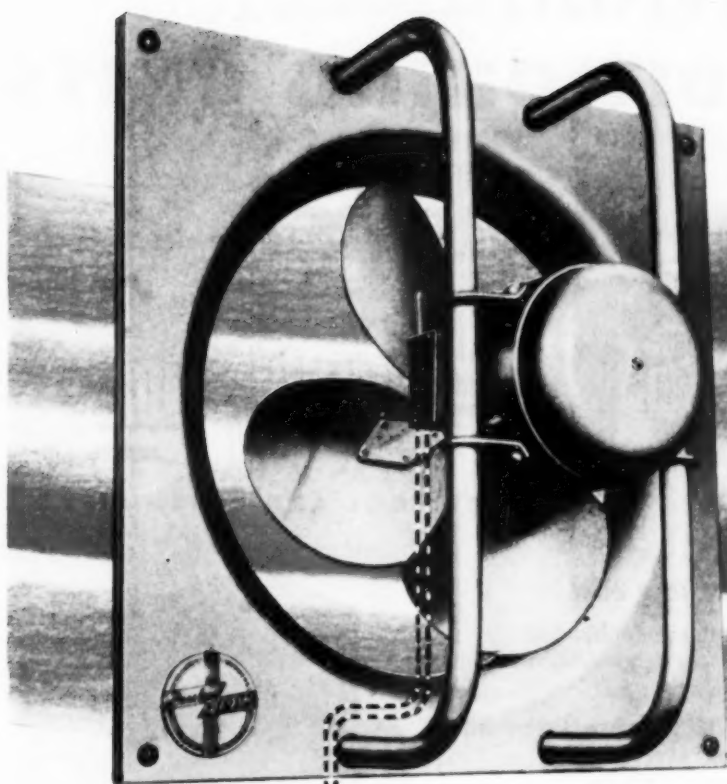


Type PAT Attic Ventilating Fans for continuous day and night operation . . . cost but a few cents a day, need lubrication just once a year.

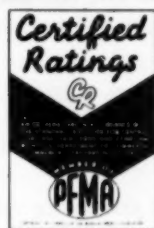


Horizontal Ventilatic Fans fit in confined areas, operate silently to exhaust fumes and heat . . . from 4,000 to 12,000 CFM capacities.





Peerless PVS Exhaust Fan furnished complete with 1, 2 or 3-speed controller starting switch . . . vertical or horizontal mounting.



*... Smoothest Performer  
on the Market!!*



THE PEERLESS ELECTRIC COMPANY

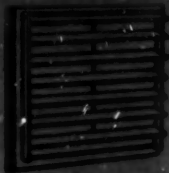
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#### A COMPLETE LINE

• Peerless-built certified fan and blower units meet every requirement of economy, efficiency and safety.

Write today for your free catalog showing the complete line of fans, blowers, louvers, shutters, penthouses, blower-filter package units and all accessories.

Remember, for dependable performance, and fast, friendly service, we've Peerless Electric since 1893.



SHUTTERS



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BLOWERS

# CLARAGE *Multitherm* AIR CONDITIONING UNITS



**THEY HEAT AND HUMIDIFY**



**THEY COOL AND DEHUMIDIFY**

## *... year-'round comfort at low cost*

Clarage Multitherm Conditioning Units are double duty machines. They keep your place cool and dehumidified in summer. They heat and humidify in the wintertime.

You save considerable in cost by having the same equipment working for you the year-'round... and every day you're assured of comfortable working conditions.

Multitherm Units come in vertical and horizontal types as shown—ten sizes—capacities 600 to 20,500 c.f.m. You use a direct expansion refrigerant, cold water or brine for cooling; steam or hot water for heating.

## *... or process conditioning*

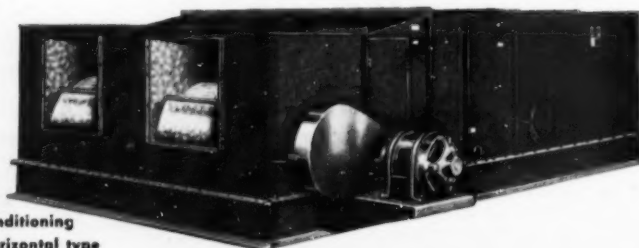
Aside from comfort applications in offices, plants, stores, etc., Multitherm Units are widely used in industry where production depends upon a certain temperature and humidity. Clarage Capillary Conditioners are available for cases where extremely close control is needed to meet requirements.

We welcome your inquiry for any desired information.

**CLARAGE FAN COMPANY**  
Kalamazoo, Mich.



Multitherm Conditioning Unit—vertical type



Capillary Conditioning Unit—horizontal type

You can Rely on...  
**CLARAGE**



Headquarters for  
Air Handling and  
Conditioning Equipment

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

## THE CONTEST WINNER!

# *Metropac Challenger*



The unanimous choice of our judges as the name best describing this unit which successfully challenges the entire field from every angle.



### First Prize \$300 Bond

goes to

Mrs. Howard Altemos  
Altemos Heating & Service Co.  
Allentown, Penna.

### Second Prize \$150 Bond

Kenneth P. Brayton  
Hathaway Oil Co.  
New Bedford, Mass.

### Third Prize \$50 Bond

Hugh O. Ellinger  
Southern Michigan  
Heating Co.  
Hillsdale, Mich.

Our sincere thanks to the many, many other Heating people for their entries. We regret that all could not win cash prizes, but we are glad that so many of you have learned about this new *Metropac Challenger* which means more business for Dealers and Contractors, and better home heating for their customers.

## *Metropac Challenger*

Combining circulating warm air heat with year-round domestic hot water supply all in ONE compact unit.

Every Heating Equipment Dealer who sells, and every Contractor who installs this unit is a winner, too. He wins the friendships and endorsement of the customer because he has supplied a unit that really challenges comparison on cost and performance. He wins because the *Metropac Challenger* really does challenge competition on price, yet yields a substantial legitimate profit.

*Desirable franchises open to preferred dealers.  
Write or wire Dept. A 49 for complete information.*

**METROMATIC MANUFACTURING COMPANY, EVERETT 49, MASSACHUSETTS**



Fred Hotop, left, discussing Zone Control with Honeywell sales engineer Mac Duncan.

## "I'll go down the line for Honeywell Zone Control"

says Fred Hotop, engineer, Edward J. White, Inc., South Bend, Ind.

"In our shop we've built the tradition that a White heating job is a job done right.

"To build a reputation of providing the finest quality heating installations, you've got to do three things well: plan the job, pick the equipment, make the installation. A weak spot anywhere in here can do lots of harm. That's why the equipment you choose is so important.

"Having proved Honeywell Zone Control equipment on so many jobs, I can say I'll go

down the line for Honeywell Zone Control.

"Zone Control is the perfect heating system. It alone provides the answer for people who want real comfort everywhere in their home.

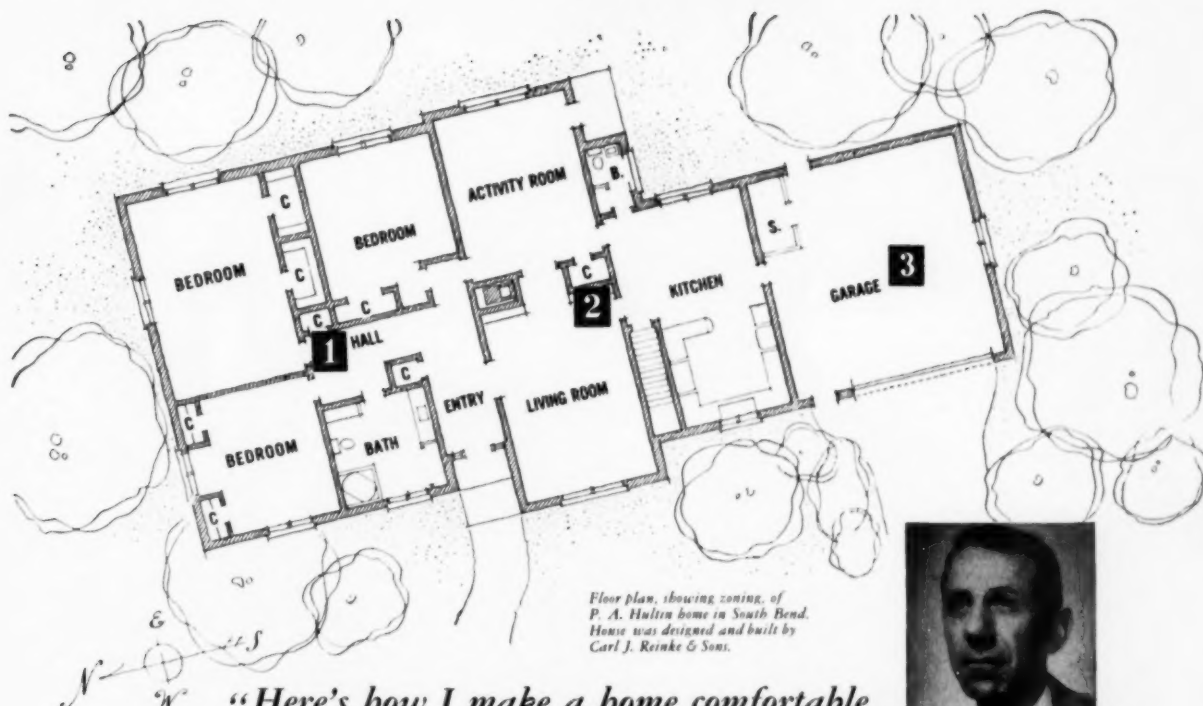
"Besides, no home heating problem is too difficult for the dealer who really *knows* Zone Control.

"With it you can handle almost every heating situation, regardless of construction, or conditions such as wind, sun, exposure, glass, or zero weather."



*Another Plus-Profit  
Idea from Honeywell*





Floor plan, showing zoning, of P. A. Hultin home in South Bend. Home was designed and built by Carl J. Reinke & Sons.



## *"Here's how I make a home comfortable throughout—with Honeywell Zone Control"*

Comfortable throughout—that's the end result, with Honeywell Zone Control. And here are the details of the story in Fred Hotop's own words. His zoning comments refer to the floor plan above.

"The Hultins were impressed—and pleased—when we went over the zoning plan.

"I explained how the thermostat for *Zone 1* would enable them to compensate for cold north winds. And how it could be used to set back the temperature and save fuel when the bedrooms weren't in use.

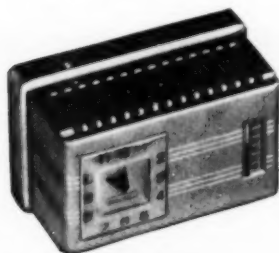
"Then I showed them how a separate thermostat

in *Zone 2* would keep the living area from overheating on sunny winter days, yet give them comfortable, even warmth.

"The thermostat controlling *Zone 3* maintains the garage area at about 60 degrees—warm enough for a garage, yet easy on fuel.

"That's just about the zoning story as I told it and sold it to the Hultins."

Fred Hotop explains other features of the job, concerning the Chronotherm and Outdoor Weathercaster below.



**CHRONOTHERM**

"I put a Chronotherm in charge of *Zone 2*, the living area. It provided the Hultins with the automatic night set-back and morning temperature pick-up they wanted."



**WEATHERCASTER**

"I installed a Weathercaster outside the house to anticipate changes in the heating load of the entire house. The Weathercaster is an ideal device for use with Zone Control."



**ELECTRONIC RELAY AMPLIFIER**

"This component is the 'brain' of the set-up. It receives signals from the Weathercaster and the indoor thermostats, correlates them and then calls for more or less heat."

*Illustrated above are some of the controls Fred Hotop used on the Hultin home — along with his reasons for choosing them. For more complete details on Honeywell Zone Control, call your nearest Honeywell office. Or write Honeywell, Dept. AA-7-70, Minneapolis 8, Minnesota.*

# MINNEAPOLIS Honeywell



*First in Controls*



**EASY INSTALLATION** is assured by special subbase which is mounted without thermostatic operating element. The element

and the case are laid aside, completely protected from any damage, until needed at the final installation stage.

# EASY TO INSTALL!

## New G-E Thermostat cuts down on nuisance

The G-E Room Thermostat is designed to cut servicemen's on-the-job time . . . keep installation and service costs to a minimum. This G-E Thermostat virtually assures the homeowner of perfect temperature control at all times, reducing nuisance complaints and unprofitable call-backs.

### INGENIOUS DESIGN SIMPLIFIES MOUNTING AND WIRING

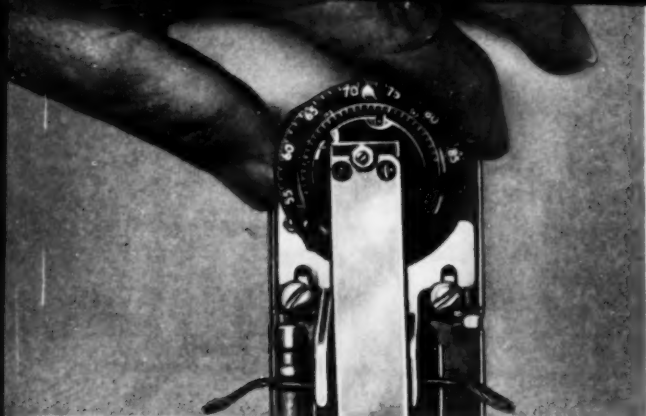
By loosening only two screws, you can remove the thermostat from the specially designed subbase. Then, as shown above, the operating unit and case can be laid aside while the subbase is mounted on the wall. A fibre insulation shield on the base serves as a drilling template as well as insulation against the air currents around the wiring. Then, after holes are drilled and wiring made, the operating unit slides right on the subbase, two screws are tightened, the plastic cover snaps on and the installation is completed!

### HOMEOWNER MAKES OWN TIME CYCLE ADJUSTMENTS

In addition to the temperature setting dial, the homeowner can easily make minor adjustments in differential with the exclusive G-E Comfort Dial, at the bottom of the thermostat. He turns the dial to the right or the left, depending on whether he wants longer or shorter furnace running periods, until he has exactly the heating conditions he wants. This comfort dial, plus a pre-heat resistor that prevents overshooting of room temperature, are two big reasons why servicemen who have installed G-E thermostats on domestic heating systems get fewer nuisance complaints.

G-E Thermostats are available for low-voltage operation, and can be adapted to practically any heating installation. Long service life is assured by silver contacts, positive action and many other top quality construction features. For full details, see your local G-E Apparatus Sales Office. Write for Bulletin GED-1832, or Service Manual GEH-1907. Address Section 740-22, General Electric Co., Schenectady 5, N. Y.

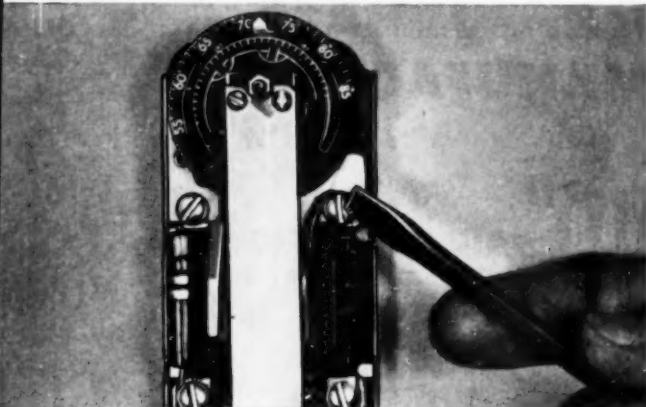
GENERAL  ELECTRIC



**QUICK MOUNTING** . . . simply slip thermostat operating element over two screws on base and tighten.



**SIMPLE ADJUSTMENT** . . . exclusive G-E comfort dial adjusts at the flick of a finger to change differential.



**EASY WIRING** . . . plenty of wiring space plus large easy-to-get-at screws mean fast, easy wiring.



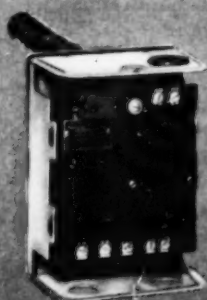
**CALIBRATES WITHOUT TOOLS** . . . hold temperature dial and turn inner dial cam until contacts close at temperature set.

# EASY TO SERVICE!

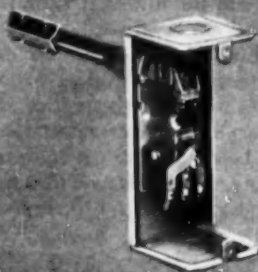
complaints and unprofitable call-backs!



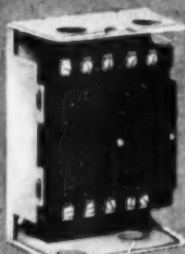
Thermostat



Stack Switch



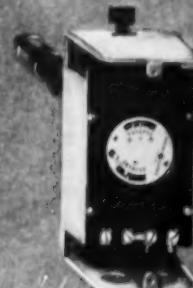
Flame Detector



Master Control



Transformer Relay



Fan & Limit Switch



Temperature Limit Control



Water Immersion Control



Pressure Control



## OIL BURNER CONTROLS

The Appliance Control Department of General Electric is devoted exclusively to developing and producing a complete line of controls for appliance and oil-heating manufacturers.

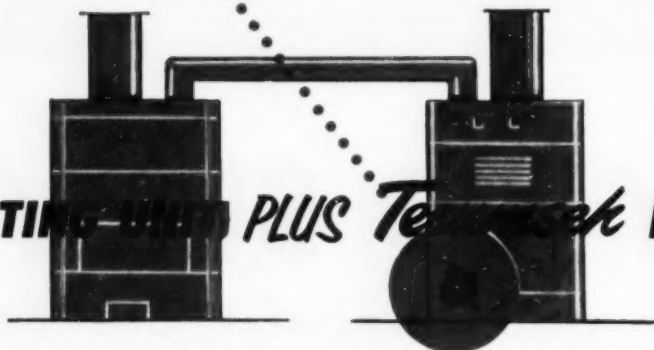


# IT'S HERE

## TO HELP YOU MR. FURNACE MANUFACTURER

DESIGN "YEAR-ROUND" AIR CONDITIONING

YOUR HEATING UNIT PLUS *Tecumseh* HERMETIC



With the introduction of Tecumseh's new line of large hermetics, your engineers can now design a summer air conditioning unit that can be sold as a package unit with your present line of oil or gas fired winter air conditioners.

Designed right and priced right these Tecumseh completely sealed Twin Cylinder Hermetics are available for 1, 1½, 2 and 3 H.P. applications. The Tecumseh hermetic, in a properly designed system, assures you of the most economical and efficient system available.

Economy, freedom from service problems and

efficiency are some of the reasons why the Tecumseh Hermetic is incorporated into the majority of room coolers. These same advantages apply to the integral H. P. compressors for year around applications.

Why not get a head start in this new market by offering your dealers a complete . . . heating and cooling . . . air conditioning unit?

Our Tecumseh representative in your territory will be pleased to give you all the facts about these Tecumseh Hermetics, simply write or call us today and he will contact you immediately.



### TECUMSEH PRODUCTS

TECUMSEH, MICH.

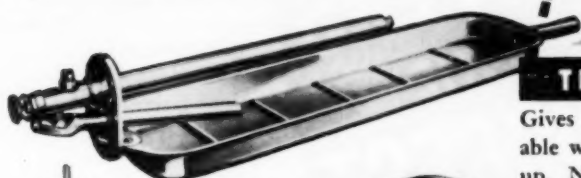
*Company*

EXPORT DEPT.: 2111 WOODWARD AVE., DETROIT, MICH.



# Automatic Humidifiers

**A COMPLETE LINE  
WITH A TYPE and SIZE  
FOR EVERY  
WARM AIR FURNACE**



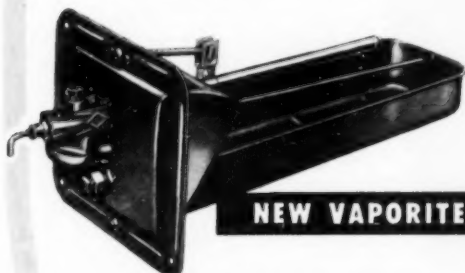
**THERMO-DRIP**

Gives furnace owners the most efficient, most dependable way to put moisture in the air. Valves don't lime up. No stagnant pool to reheat. Sensitive thermostat. Easily installed. Water drips into pan only after pan is sizzling hot. This puts the most moisture into the air stream when it is most needed.



**THE VAPORITE 555**

Completely assembled for lowest cost installation . . . uses Automatic humidifier drip feed principle. Positive thermostat control feeds water to vapor pan according to heat. Pan is dry when furnace is cold. Stainless steel pan insures rapid heat transfer to water. One size, one kit slashes time and labor cost.



**NEW VAPORITE 577**

Made especially for sloping bonnet furnaces, but adjustable so that it can be installed just as easily on straight bonnets. Preassembled for fastest installation. Can be adjusted to any angle of bonnet pitch with an ordinary screw driver. No hard-to-get-at nuts and bolts. No iron framework to level the vapor pan. Made of stainless steel. Weighs less than 4 pounds. Vapor pan is supported permanently and rigidly in level position. Cannot sag.



**VAPORITE SERIES 500**

Uses famous drip feed principle of putting moisture into the air . . . a measured amount at a time. Thermostat accelerates drip rate as furnace becomes hotter. Cuts down rate as furnace cools. This keeps air properly balanced with moisture at all times. Uses stainless steel pans.



**MODEL CF500**

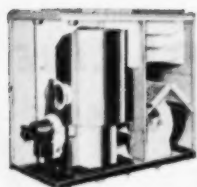
**FOR COUNTER FLO FURNACES**

Makes healthful humidified warm air available in homes with perimeter systems. Requires no pans to buy or install. Bottom of plenum chamber in concrete floor is evaporating surface. Drip feed automatically accelerates or shuts off as furnace temperature fluctuates. When furnace is not in use, plenum chamber is dry.

A 73

Write today for free literature on these most efficient, most dependable humidifiers.

**AUTOMATIC HUMIDIFIER COMPANY • CEDAR FALLS, IOWA**



Basement Air Conditioning Units Approved for Either Gas or Oil



Counterflow Units Approved for Either Gas or Oil



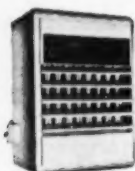
Utility Units Approved for Either Gas or Oil



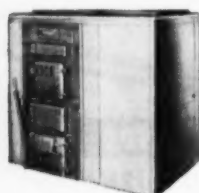
Gravity Furnaces Approved for Either Gas or Oil



Horizontal Furnaces Gas Fired and Oil Fired



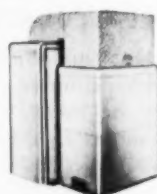
Unit Heaters Gas Fired 4 Sizes in greatest demand



Air Conditioning Units Coal Fired Also efficient with Gas or Oil



Incinerators With or without Gas Burner



Year 'Round Air Conditioning Units 2 and 3 Ton Refrigerating Units



Summer Air Conditioners 2 and 3 Ton Cooling Capacity

*Luxaire*  
**OFFERS**  
 THE  
**BIGGEST**  
 Selection of  
 Heating and  
 Year 'Round  
 Air  
 Conditioning  
 Units

For Perimeter  
 Small Pipe  
 Conventional  
 Installations  
 . . .  
 Horizontal Furnaces  
 Counterflow Units  
 Basement A. C. Units  
 Utility Units  
 Gravity Furnaces  
 Gas Unit Heaters  
 Approved for GAS  
 Approved for OIL  
 Summer Air  
 Conditioning Units

Coal Furnaces, Cast Iron and Steel,  
 Forced Air and Gravity. Large  
 Furnaces 34" Coal . . . 212,000  
 B.T.U. Oil . . . 250,000 B.T.U. Gas.  
 A complete range of sizes in Gun  
 Type Oil Conversion Burners and  
 Luxaire single port Gas Conversion  
 Burners. Incinerators. Blower  
 Filter Units.  
 Order everything from one source  
 with Luxaire. See your Luxaire  
 jobber for complete details . . .  
 descriptive literature and dealer  
 selling helps.

THE C. A. OLSEN MANUFACTURING COMPANY • ELYRIA, OHIO  
*Luxaire* HEATING & AIR CONDITIONING UNITS

SOME ANSWERS TO YOUR SHOP QUESTIONS ON

# finishing straight-chromium Stainless Steels

*This is another in a series of advertisements discussing the straight-chromium grades of Stainless Steel from the standpoint of fabricating performance. Other operations that will be considered in future discussions are machining, cutting and spinning.*

**S**TRAIGHT-CHROMIUM grades of Stainless Steel such as U·S·S 17 (Type 430) have finishing characteristics much like those of the nickel-bearing grades, although more or less work may be required according to the form in which the steel is used.

Type 430 Stainless develops a higher color than may be produced by the same amount of work on nickel-bearing grades; the surface resembles chrome plate when fully polished.

In some cases, severely formed or drawn surfaces may require more work than nickel-bearing grades. This is due to the directional tendencies of the metal and may require extra stock removal or polishing. Care should also be taken to overcome the galling and scoring tendencies of these grades which are inclined to "load" the surface of the polishing wheel. "Loading" may be retarded by a suitable cutting oil.

It is characteristic of Stainless Steel that heat developed during polishing may tend to disturb flatness. However, the low coefficient of thermal expansion of these straight-chromium grades minimizes this condition.



**TYPE 430  
takes excellent finish  
on double-drawn  
20-quart dishpan**

When grinding welds, the same precautions should be exercised as in handling nickel-bearing grades. These include grinding along the bead instead of across it.

If you have special problems at any point in your fabricating operations, our representatives will be glad to assist you. And you will find valuable help in our book, "Fabrication of U·S·S Stainless and Heat-Resisting Steels." For your copy, write to United States Steel Corporation, Room 2813-C, 525 William Penn Place, Pittsburgh 30, Pa.

The Peal Manufacturing Company, Cincinnati, Ohio is producing these 20-quart dishpans for the Quartermaster Corps from Type 430 Stainless Steel.

Sheets of .043" thickness are octagonal blanked and then drawn twice with tapered-side draws. The end flange is curled in and surface grinding follows. Handles are spot welded to the pan.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO  
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

## U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL



**LAU**

offers you the ALL NEW, refined and improved

Small, compact, efficient and quiet

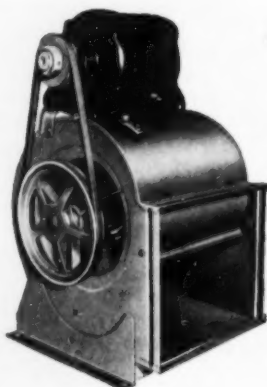
### A 7½" Double Inlet Blower with motor built INTO the Unit

The ALL NEW LAU A7-DD pictured here is the perfect unit for in-a-wall gas and oil furnaces. It is the one answer to manufacturers who build hi-boy, low-capacity units. It is completely UL approved, covering the entire unit (also approvable in combination with furnace).

The A7-DD has fingertip adjustment for wide range 7-speed control. For furnaces to be rated at capacities from 44,000 to 76,000 b.t.u. per hour (bonnet) at 100° temperature rise—or capacities from 31,000 to 54,000 b.t.u. per hour (bonnet) at 70° temperature rise.



Completely UL approved  
table unit



Write dept. A  
for full  
information

### Lau Series "A" blower assemblies

The all-time outstanding achievement in the blower field. Overall size is considerably smaller than formerly and many features are revolutionary—exclusive with Lau—and protected. Entire unit is die-formed, lending itself to mass production on precision-built equipment with reflected low costs. Has 1-pc. motor mounting, self-aligning bearing, new LAUsteel pulley wheel. Write for Catalog 602 giving complete dimensions and performance data.



**THE LAU BLOWER COMPANY • DAYTON 7, OHIO**



# NEW DIVISION CREATED TO HANDLE RESIDENTIAL AIR CONDITIONING BUSINESS

## American-Standard Sets Stage for Wide Distribution, Intensified Selling in Growing Market

As of July 1st., all operations of the Warm Air Heating Department of the American Radiator & Standard Sanitary Corporation have been taken over by a new and entirely separate division known as the SUNBEAM AIR CONDITIONER DIVISION. The new division handles the com-

plete line of American-Standard warm air heating and cooling products.

The formation of this new division is prompted by the increasing importance of the year 'round air conditioning industry . . . and especially our own growth in this business.

Among the advantages offered by the creation of this new division are:

1. Intensified coverage of markets to provide wide distribution.
2. The development of new and improved products.
3. Maintenance of a fast, efficient production schedule to meet current and anticipated demand for our top quality products.
4. Close cooperation with wholesale and retail trade to expedite and simplify buying and selling practices.
5. A concentrated program of national and cooperative advertising and promotion.

With the backing of the vast heating experience of American-Standard, and the carrying through of the above objectives, we are confident that our new division will make great strides in serving both home and industry.

The executive offices of the new division are located in Pittsburgh. All manufacturing and distribution of products originates at our plant in Elyria, Ohio. Field sales offices are located in principal cities throughout the country.

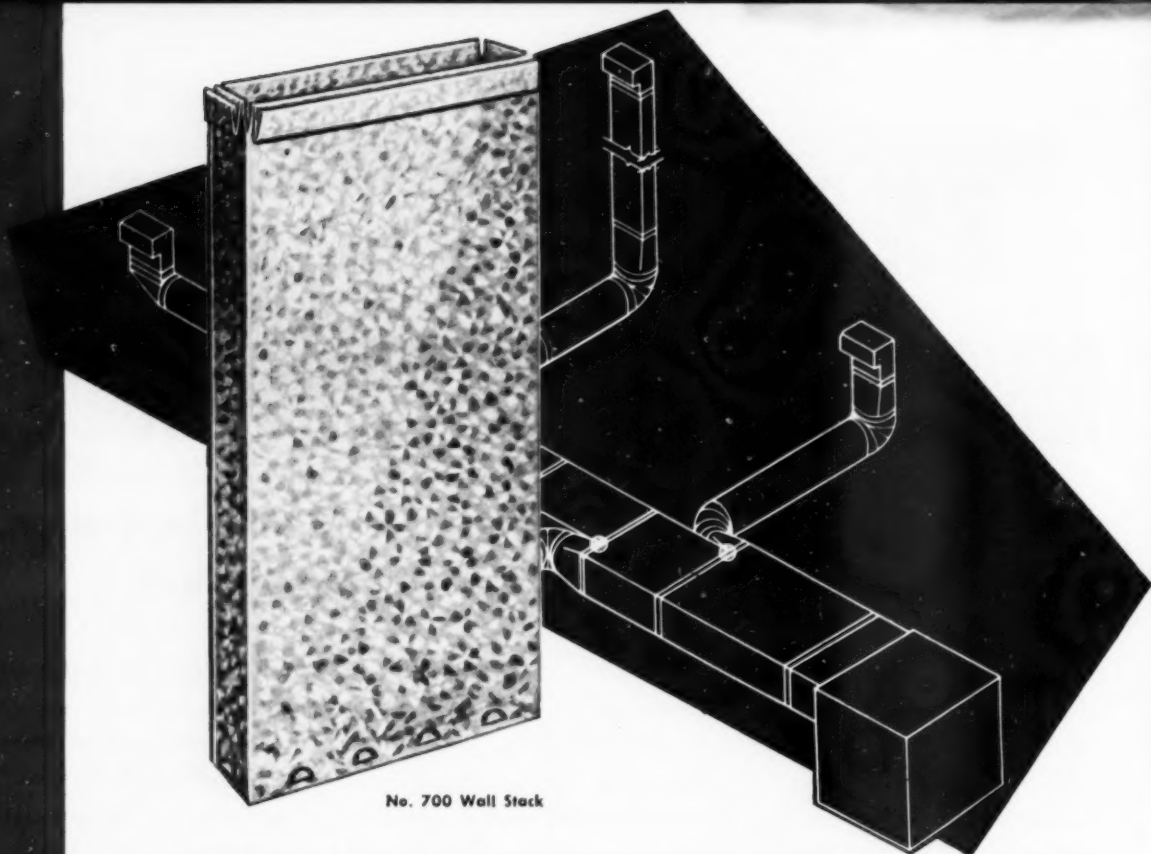


## AMERICAN-Standard

### SUNBEAM AIR CONDITIONER DIVISION ELYRIA • OHIO

Executive Offices: Bessemer Building • Pittsburgh 22, Pa.

Serving home and industry: AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS



No. 700 Wall Stack

## Work-saving features cut installation time of **MILCOR\*** Forced Air Pipe and Fittings

Here's why you can install snug, clean-looking jobs that stand up, with Milcor Forced Air Pipe and Fittings:

Patented, quick-lock makes special tools, solder, rivets, or screws unnecessary. You cut down roughing-in and erection time.

Precision manufacture makes Milcor fittings and accessories easy to handle, easy to fit.

A complete, related system of standardized units helps you meet almost every condition. The line includes round pipe, rectangular duct, elbows, angles, reducers, take-offs, stack adapters, etc.

Milcor Catalog 500 gives you list prices and specifications on Milcor Furnace Pipe and Fittings. If you don't have a copy, write for it on your business letterhead.

### INLAND STEEL PRODUCTS COMPANY

4023 WEST BURNHAM STREET

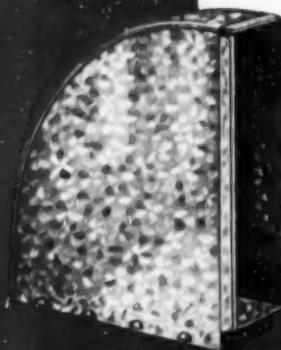
MILWAUKEE 1, WISCONSIN

BALTIMORE 5, MD. — 5300 Pulaski Highway • BUFFALO 11, N. Y. — 64 Rapin St. • CHICAGO 9, ILL. — 4301 S. Western Avenue Blvd. • CINCINNATI 23, OHIO — 3240 Spring Grove Ave. • CLEVELAND 14, OHIO — 1541 E. 38th St. • DETROIT 2, MICH. — 690 Amsterdam Ave. • KANSAS CITY 41, MO. — P. O. Box 918 • LOS ANGELES 58, CALIF. — 4807 E. 49th St. • NEW YORK 17, N. Y. — 230 Park Ave. • ST. LOUIS 10, MO. — 4215 Clayton Ave.

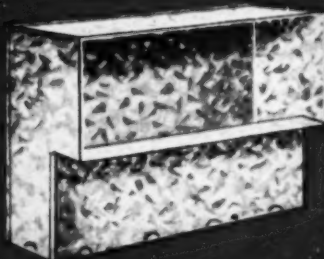


\*Reg. U. S. Pat. Off.

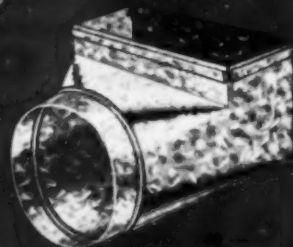
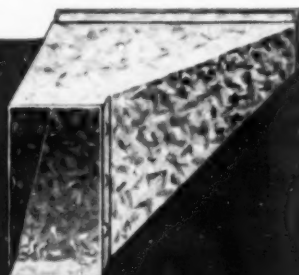
S-113



No. 715 22" Dia.



No. 700 Stack Adapter



# WHAT'S HAPPENING

## Gas Utilities Add Over a Million Customers

THE GAS UTILITY industry added 1,090,000 new house-heating installations during the 1952-1953 heating season, the American Gas Association reports. In a survey made a year ago, it was estimated that 1,079,000 new gas house heating customers would be added in the past heating season. Existing restrictions on new heating installations in some areas resulted in a decline in new installations in the 1952-1953 season from 1,514,000 new gas house heating customers added in the 1951-1952 season.

The additions made in the past season, plus corrected estimates in existing gas house heating users, brought the total number of residential heating customers served by the industry to 11,728,000, equivalent to 48 per cent of all residential customers. This saturation compares with 44.7 per cent one year earlier.

It is expected that restrictions during the next three heating seasons will be less severe as pipe line capacities and underground storage facilities continue to expand. This forecast is substantiated by the estimate made by reporting gas utilities of an additional 1,221,000 new gas house heating installations in the 1953-1954 heating season, and nearly 1.2 million more homes to receive gas house heating in each of the 1954-1955 and 1955-1956 heating seasons.

During the 1953-1954 heating season it is estimated that 53.8 per cent of the new gas house heating installations will be located in new dwellings. In the two subsequent periods the proportions of new and existing structures will be virtually equal, the survey shows. Reports were received by AGA from 322 companies serving 22.7 million customers, and representing 93 per cent of all residential gas customers.

Effective March 1, 1953, the Petroleum Administration for Defense rescinded its Gas Limitation Order No. 2. Consequently, gas house heating restrictions are once again subjected to the jurisdiction of state regulatory authorities.

### Committee Discusses Oil Tank Specifications

DURING THE CHICAGO CONVENTION of the Oil Heat Institute, an OHI committee met with Herbert Witte of Underwriters Laboratories to discuss UL's proposed revisions for inside storage tanks. Under Section 16 of the proposed changes in specifications for 275-gallon storage tanks is listed the requirement that all openings on top of the tanks shall be of the same size and not less than 2 in. pipe size. The committee suggested a change — because of local needs based upon local delivery conditions — that requirements as to the number and size of

openings be left to the individual dealer, so long as the minimum size opening is  $1\frac{1}{4}$  in.

Sections 18 and 19, covering the bottom openings in the tank shell and pitching of tanks to a low point toward the burner supply connection, also were discussed in detail.



THE MADISON SHEET Metal Joint Apprenticeship Committee is composed of members of the Madison Sheet Metal Contractors Association and the Madison Sheet Metal Workers International Association, Local No. 279. Shown above are (l. to r.) C. J. Reuschlein; W. F. Herrling; R. C. Phillips, Bureau of Apprenticeship; W. G. Martin, sheet metal instructor, Madison Vocational School; A. H. Nelson; Ralph Kuhlman; G. F. Wolff; and Arlan Anderson.

### Apprenticeship Training Prize Given

THE MADISON, Wis., Sheet Metal Joint Apprenticeship Committee was winner of the plaque awarded by the National Joint Sheet Metal Workers Apprenticeship Committee to the committee making the greatest contribution to apprenticeship training during the year 1952. The Madison committee submitted a bound book giving information on the number of apprentices being trained in the area; the term of apprenticeship; the amount of related instruction required in the Madison Vocational School; the type of related instruction that is taught; the type of final examinations; methods used for the screening of apprentice applicants; methods used for financing the affairs of the committee; how the work of the committee is publicized, etc.

### Indoor Comfort Conferences Go West

THE NATIONAL WARM AIR HEATING and Air Conditioning Association is planning to hold six two-day warm air heating schools on the West Coast during August. These conferences are primarily designed for dealers and others interested in the design and installation of warm air heating equipment, and are non-technical in nature.

## WHAT'S HAPPENING —

Classes are scheduled for Portland, Ore., August 7 and 8; Sacramento, August 10 and 11; San Francisco, August 13 and 14; Fresno, August 20 and 21; and Los Angeles, August 27 and 28.

Although the material planned for the West Coast schools is being modified to meet local heating requirements, the instruction will cover heating and cooling applications similar to the material presented at the other 1953 classes. The program will include information on the design and installation of perimeter heating in basementless houses constructed on concrete slabs and built over crawl spaces; small pipe perimeter heating using 4 in. round pipe for the air distribution system; and summer air conditioning for new and existing residences.

### Gas Industry Has "Blueprint for Action"

A "BLUEPRINT FOR ACTION" to achieve the aims of the recently announced Gas Industry Development Program was presented to members of the Gas Appliance Manufacturers Association at its 13th annual meeting at White Sulphur Springs, W. Va.

James F. Donnelly, president, told the 400 delegates in attendance that the program had been planned to take advantage of the opportunities and to solve the problems which have arisen from the growth of the gas industry during the past 10 years. Mr. Donnelly, who is also vice president of Servel, Inc., reviewed the work done during the past year to set up the step-by-step program now being submitted to heating manufacturers. The program includes recommendations to manufacturers on a variety of subjects, including market potentials, sales training, sales promotion, financing facilities, product development, service, installation and safety.

Officers elected at the meeting are: Sheldon Coleman, president; T. T. Arden, first vice president; W. F. Rockwell, Jr., second vice president; and Lyle C. Harvey, treasurer.

Officers of divisions, chairmen of which automatically become members of the board of directors, are as follows:

Gas house heating and air conditioning equipment division: Harold C. Day, chairman; Clarence Coleman, vice chairman; and E. A. Norman, Jr., executive committee member.

Gas furnace group: Herbert G. Hayes, chairman; G. W. Denges, vice chairman; and George E. Hochstein, executive committee member.

Gas floor furnace group: F. Donald Hart, chairman; Russell Jarrett, vice chairman; and Clarence Coleman, executive committee member.

Vented recessed heater group: A. J. Horn, chairman; F. A. Ryder, vice chairman; and Clarence Coleman, executive committee member.

Unit heater group: D. R. Webster, temporary chairman.  
Gas conversion burner group: Harry Gurney, chairman; E. P. Hayes, vice chairman; and Arnold A. Muenzer, executive committee member.

### Business Inventories in Balance

BUSINESS INVENTORIES were relatively stable in the first few months of 1953, following a rapid expansion during the final quarter of 1952, according to a recent report

from the Office of Business Economics, U. S. Department of Commerce.

Total stocks held by manufacturers, wholesalers, and retailers, at a book value of \$75 billion, are generally balanced and roughly in line with current sales. These findings appear in an analysis of stocks presented in the May issue of the *Survey of Current Business*, official publication of the department's Office of Business Economics.

The article concludes that present inventory-sales balance can be maintained as long as sales continue at the current high rate. The basis for wide inventory movements, in the absence of a change in the trend of sales, does not appear to be present. Industrial prices have been stable for some time, and supplies of most goods are generally adequate for prompt deliveries.

The book value of all business inventories rose \$2.4 billion on a seasonally adjusted basis between August 1952 and March 1953. Practically all of this rise occurred in a few sectors — in the motor vehicles, other transportation equipment, and primary and fabricated metals manufacturing industries, and at retail automotive dealers. A substantial part of the increase was associated with the replacement of normal stocks which were depleted during the steel strike in the summer of 1952, but some of the expansion was required to support higher sales. OBE finds that in the first quarter of this year the rise in inventories was small relative to that in the final quarter of last year, indicating that the re-balancing resulting from these two developments was generally completed by the end of last year.

Inventories seem to be moderately high for durable goods industries as a whole, in relation to current sales, on the basis of prewar relationships. However, this is in part attributable to the high percentage of stocks of in-process materials entering into defense production. One-third of all durable goods manufacturers' stocks are for use in defense output. The long production period required for the more complex type of defense items entails high goods-in-process stocks, the article states.

### May Televisé Sales Meetings

SALES MEETINGS may soon be beamed to local areas via closed circuit television, according to a recent release from Cappel, MacDonald & Co., sales incentive specialists. The network covers 62 cities with a total of 110 theaters. Closed circuit television can originate at a company's headquarters and be piped to theaters in regional areas, thus eliminating the need for national sales meetings, or it can be produced in a theater and beamed to a meeting in another part of the city or in a distant locality.

Emphasizing the flexibility of the service, Elton F. MacDonald, president of the firm, said: "The complete presentation can be worked out on short notice for a single theater or the complete chain of theaters now linked in the closed TV circuit network."

Price of the show can be varied from a one-hour production costing less than \$5000 to more elaborate programs to fit the specific needs of a company.



VALUE-PRICED!

QUALITY-ENGINEERED!



## Now! A new heating unit for Sure-Fire Efficiency...Sure-Fire Sales!

This new Richmond vertical winter air-conditioner is designed to fulfill the heating needs of small homes and apartments. It offers your customers outstanding efficiency at an exceptional value . . . offers your gas-heating line an unusual profit opportunity.

The Richmond SV-40-G with an 85,000 BTU/HR input is a fully automatic, factory-assembled, gas-fired unit that is AGA

approved. Other features include a light-green hammertone jacket, a 12-gauge heat exchanger and a large-size, slow-speed blower.

Each Richmond SV feature is quality-engineered for maximum heat output and for extremely economical operation. And each feature in this new Richmond unit reflects the most in-demand requirements of today's homeowners.



# RICHMOND

RICHMOND RADIATOR CO. — AFFILIATE OF REYNOLDS METALS CO.

See your wholesaler or Mail Coupon Today

Richmond Radiator Company  
Box 111, Metuchen, New Jersey.  
Please send me more information and literature on the new Richmond SV heating unit. No obligation, of course.

NAME.....  
COMPANY.....  
ADDRESS.....  
CITY.....ZONE.....STATE.....

We are ☐ heating wholesalers ☐ heating contractors ☐ building contractors.

Flexible MICROLITE blanket conforms readily to irregular shapes.



Extremely light in weight with good tensile strength for easy handling in large sections, even overhead.

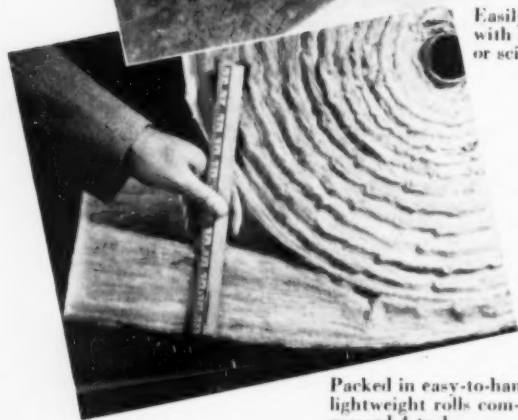


*When you've got  
ducts to wrap...*

**You'll save time—  
You'll do it easiest—  
with MICROLITE**



Easily cut  
with knife  
or scissors.



Packed in easy-to-handle,  
lightweight rolls com-  
pressed 4-to-1.

**MICROLITE** *Glass Fiber Insulating Wool* is a natural for wrapping ducts. It's soft—it's resilient—it's pleasant to handle—it's easy to cut.

Extreme light weight of Microlite minimizes attachment and mounting points—without danger of insulation sag. Weighing only  $\frac{1}{2}$ -pound per cubic foot, enough B-305 Microlite to provide 1" of insulation on a 1' x 2' x 100' duct weighs only 50 pounds.

Inch for inch, Microlite is one of the most effective of all insulating materials. Half-pound density Microlite has a "k" factor of .25 at 50° mean; a Noise Reduction Coefficient for 1" thickness of .60. You can't conscientiously proceed with any insulating job until you've investigated Microlite, a product of Glass Fibers exclusive electronic-extrusion process. Write for descriptive Microlite brochure and detailed duct application manual. Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, Ohio.



**GLASS FIBERS INC.**

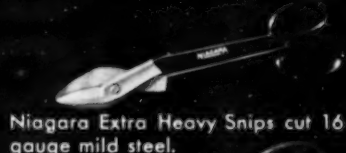
Makers of glass fibers by the ELECTRONIC-EXTRUSION process—developed, patented and used exclusively by Glass Fibers Inc.

VITRON Yarns • Rovings • Micro-Fibers • Pipe Wraps • Industrial Mats • MICROLITE Thermal and Acoustical Insulation  
DURAMAT Vapor Barriers • VIBRAGLASS Mounting and Packaging Materials • COUSTIC-AIRE and THERMO-JET Aircraft Insulations.

# NIAGARA

## BUYER'S GUIDE FOR SHEET METAL WORKERS

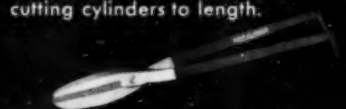
• The hand tools shown on this page are just a few of the hundreds of machines and tools which are helping sheet metal workers do better work with less effort and lower cost. Men who take pride in their work find there is economy in Niagara proven high quality. Niagara has been a quality name since 1879. Ask your dealer or write for information in regard to America's most complete line of machines and tools for plate and sheet metal work.



Niagara Extra Heavy Snips cut 16 gauge mild steel.



Niagara Double Cutting Shear for cutting cylinders to length.



Niagara Bench Shear for heavy duty hand shearing.



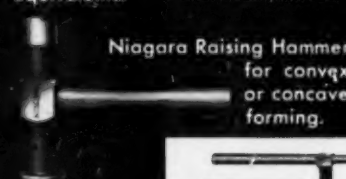
Niagara Bench Plate for rigidly mounting stakes, bench shears, etc.



Niagara Straight Edge for accurate layout work.



Niagara Circumference Rule graduated in inches and circumferential equivalents.



Niagara Raising Hammer for convex or concave forming.



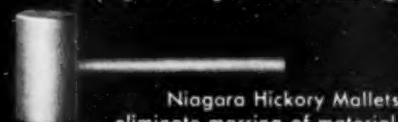
Niagara Stakes made in a complete line of essential shapes and sizes.



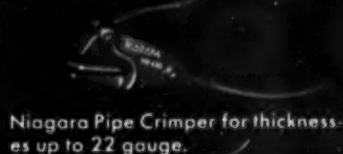
Niagara Gutter Beaders designed for convenient operation.



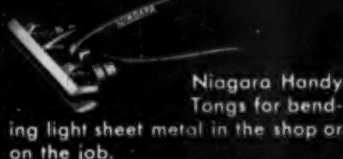
Niagara Hand Seamers for finishing standing seams on roofing.



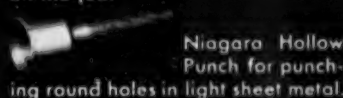
Niagara Hickory Mallets eliminate marring of material.



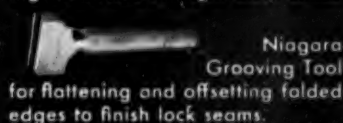
Niagara Pipe Crimper for thicknesses up to 22 gauge.



Niagara Handy Tong for bending light sheet metal in the shop or on the job.



Niagara Hollow Punch for punching round holes in light sheet metal.



Niagara Grooving Tool for flattening and offsetting folded edges to finish lock seams.



Niagara Rivet Set made of alloy tool steel, heat treated.



Niagara Riveting and Setting Hammers have forged steel heads, heat treated, polished and fastened to handle with steel wedges.

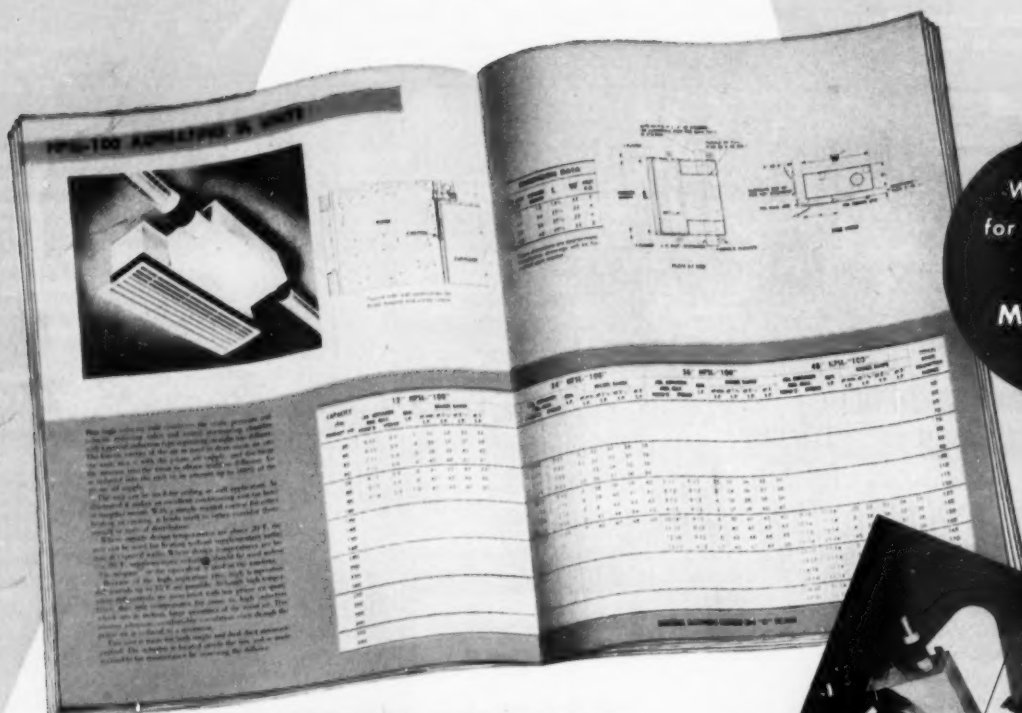


Niagara Wood Roofing Folder for light weight, low cost folding.

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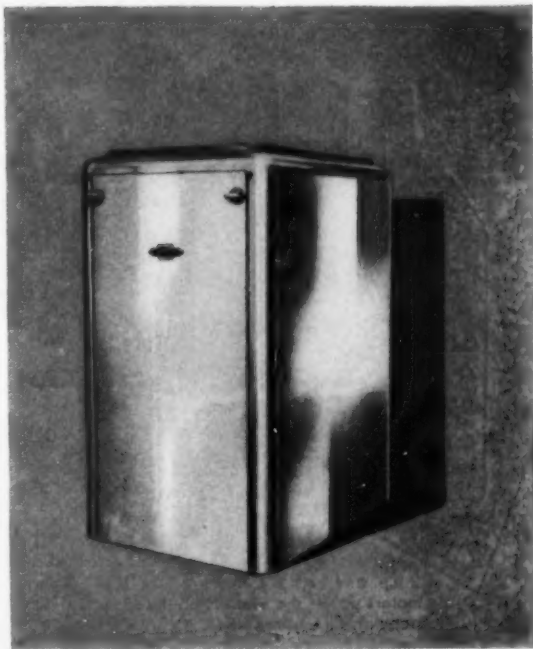
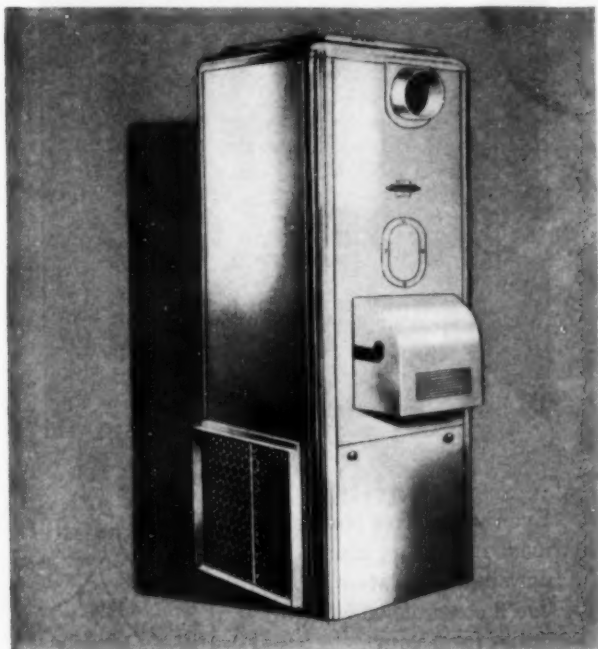
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*The money really rolls in, with the line that's engineered for bigger sales to project builders!*



## Two new value leader DELCO-HEAT Gas Conditionairs open new franchise opportunity

Here are two compact, low-priced, small capacity units geared for competitive bidding with full profits for you. At left is Model GVC 90-H for utility room or closet installation. At right is Model GVC 90-LD for basement, recreation room or where overhead space is restricted. Both feature a single port, inshot type burner with stainless steel flame spreader. Here's more proof that Delco offers the greatest franchise opportunity in the industry. Write Delco Appliance Division of General Motors, Dept. AA, Rochester 1, N.Y. In Canada, Delco-Heat, Toronto 13, Ontario.

Model	AGA Ratings Btu per hour		Dimensions
	Nat., Mfg. Mixed Gases		
	Input	Output	
GVC 90-H	90,000	72,000	67¼" high 25" square
GVC 90-LD	90,000	72,000	42¼" long 49" high—25" wide

For a good deal—  
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**GENERAL MOTORS  
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General Motors Engineering

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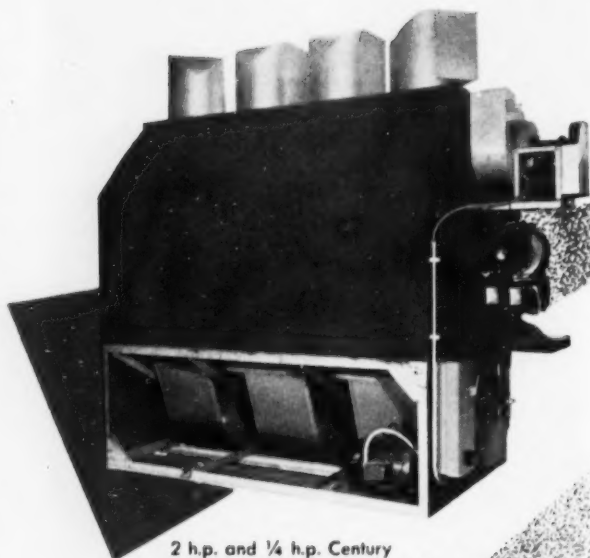
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... a complete line of automatic oil and gas-fired conversion burners, Conditionair forced warm air furnaces, boilers, and electric water systems.

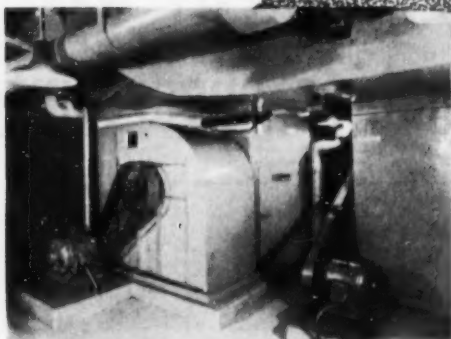
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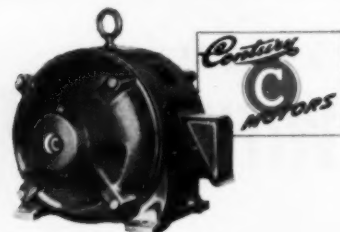


Leading manufacturers of heating, ventilating and air conditioning equipment choose Century motors to bring out the best performance in their products. The wide range of Century motor sizes and types enables them to select exactly the right motor design and torque characteristics to do the job best.

For help with your motor problems—replacement or new applications—consult the Century Branch Office nearest you, or conveniently located Century distributor. A nationwide network of Century Service Stations is always at your service to help you keep your customers happy.

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813



# IT'S EASY TO SELL


these New, Improved 


## OILIFTERS and TRAP-ITS

 **Sell freedom  
from  
fuel handling!**

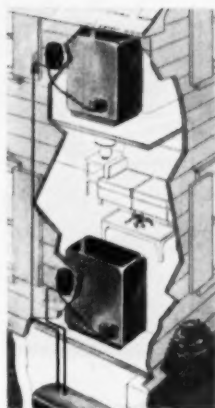
Every space heater customer is a sure prospect for the clean, easy fuel handling he'll get with this new model A-P Oilifter. Yes, here's a dependable, fully automatic oil supplier that saves time, steps and drudgery.

The A-P Oilifter pumps fuel from a submerged tank up to a furnace or from a basement or ground-level tank to a heater on the first, second or third floor, up to 25 feet.

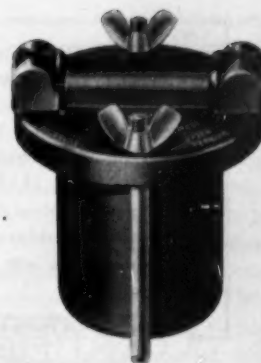
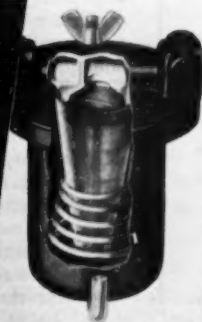
Model 356 features increased capacity, mechanical safety-float protection, automatic safety cutout switch, integral strainer and highly efficient pump. Requires no overflow pipe. 

 **Sell freedom  
from burner failure  
due to dirty oil!**

Here's a type of "insurance" you can sell every oil heating customer — the new Model 243 SY A-P Trap-it. You sell insurance against the danger of burner failure due to dirt, moisture and other impurities in oil . . . insurance against flame failure, erratic fuel flow, oil leakage and sluggish operation . . . and insurance against costly service calls. Easy-to-clean, lifetime strainer.



**Strainer  
element  
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oil quickly  
and  
completely**



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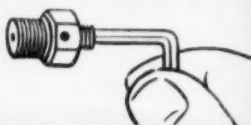
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# SUNDSTRAND

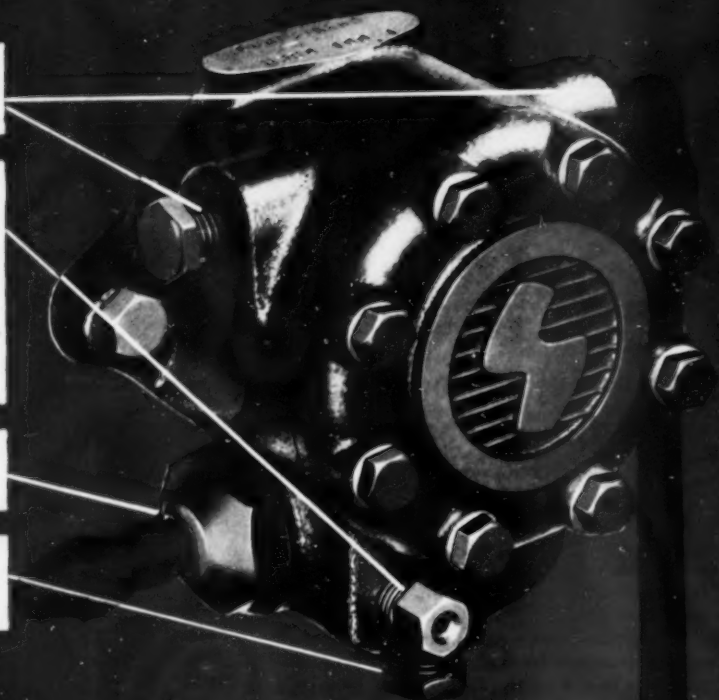
**Inlet line ports  
on either side**

**Air bleed plug  
for simplified start... on  
single-pipe installations**



**Nozzle line port**

**Return line port...  
easy to connect**



## Fuel Units are easier to install and service . . .

**Model "J" Single-Stage . . .  
Model "H" Two-Stage**

For 3, 6, 10, 14 and 20 Gph  
firing rates . . . Strainer ca-  
pacities—6, 10, 15, 20 Gph  
. . . Solenoid Valves optional  
on factory assemblies only . . .  
interchangeable with earlier  
models.

**INDIVIDUALLY TESTED AND  
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• All ports are conveniently located out in the open where connections can be made easily and quickly with minimum piping. An inlet port on each side of the unit lets you use the one that best fits the installation. The other port can then be used for a gage when checking vacuum. Return and nozzle line ports are readily accessible, too, so there is plenty of room to swing a wrench when connecting these lines. Porting arrangements on the "J" single-stage and the "H" two-stage are

identical. This makes them easy to interchange if desired. For extra convenience on the model "J" with a single-pipe hookup, an air bleed plug can be inserted in the gage port to bleed off air at initial start-up or after the tank has run dry. A couple of turns with an Allen wrench bleeds all air out of the unit without fuss or muss, eliminating air lock or churning. (Bleeder plug available at slight extra cost.) Write or phone for latest information and prices on Models "J" and "H."



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FUEL UNITS**

SUNDSTRAND MACHINE TOOL CO.  
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## *Arnold Kruckman's Washington Letter*

# How Dealer Can Arrange Title I Loans

BY THE TIME this "letter" is published, Federal Housing Administration Title I operations should have fresh authority totaling \$1.75 billion to insure qualified lending institutions against loss from loans for the repair and improvement of homes and other structures.

Inquiries received here indicate that there is much confusion in peoples' minds about the operations of FHA's Title I and Public Housing Administration's operations. The two agencies actually have no relation except that they come under the direction of the administrator of the Housing and Home Finance Agency, who now is Albert M. Cole. In passing, it may be noted that the domain of this agency, which has expanded gradually since 1932, includes — in addition to the FHA and PHA — the National Housing Council, the Division of Housing Research, the Federal National Mortgage Association, the Federal Home Loan Bank System, the Division of Community Facilities and Special Operation, the Home Loan Bank Board, slum clearance and urban redevelopment operations, defense housing, credit restrictions connected with the Federal Reserve Board, Federal Savings & Loan Corp., special program for Alaska housing, college housing program, prefab financing, farm housing program, Home Owners Loan Corp., disaster relief operations, and Korean relief housing.

### **Annual Volume of Title I Loans Greatly Increasing**

The Federal Housing Administration began operations in 1935. The prime objective of FHA is to encourage private lending institutions to make money available to those who need it to make repairs on their homes and other property, as well as to finance the construction of new buildings. The long range purpose, as stated in the preamble to the National Housing Act, is "to encourage improvement in housing standards and conditions". The Administration is now headed by Guy T. O. Hollyday.

In 1935, \$200 million was loaned by financing institutions under the guarantees of Title I loans. In 1947 this annual volume had grown to \$530 million dollars, and in 1952 it approached \$1 billion annually. At the present time it is estimated that 5000 banks and other lending institutions with 3000 branches are actively

making these loans. Moreover, it is estimated that between 250,000 and 300,000 contractors and dealers have cooperated with the banks in placing these loans for repairs and rehabilitation and in some instances for new non-residential construction.

FHA has no direct relationship with those to whom the loans are made which it guarantees. The banks form pools of such loans. The intermediary between the bank — or lending institution — and the borrower is the contractor or the dealer. In effect, he goes out and in various ways finds the clients who wish the repairs on or rehabilitation of their homes or other structures, or who wish a new structure of some kind which falls within the range of FHA law. The dealer or contractor in many instances advertises, or he gets business by associating with others in radio programs, making a mail campaign, etc. FHA naturally does not have much direct information about the methods used. The banks have the best information.

### **How Dealer Should Arrange Loan Contract**

When the dealer finds a client who wishes to borrow to make whatever improvements he has in mind, the contractor or dealer first computes the total cost of the job. The regulations require that he should prepare a written proposal addressed to the customer, giving a detailed description of the work to be done. Then, using a "gross charge and discount table" which is supplied by FHA, he tells the customer the amount of his payments and how many he will have to make to repay the loan in full. If the work is agreed upon, the contractor is told that he should prepare and sign a contract or sales agreement in at least three copies — one for himself, one for the customer and one for the lending institution. FHA suggests that the contractor be warned that the wording of the contract should give (1) the type of improvement, (2) the extent of the improvements, and (3) a brief description of the materials to be used.

The next step, according to FHA, is for the customer to complete a credit application. FHA, through the bank or directly through its field offices, will supply the contractor or dealer with a copy of the kind of credit appli-



# Washington Letter

cation blank FHA thinks should be used. It insists this blank, for its satisfaction and the bank's satisfaction, should be filled out carefully and completely. It urges that the dealer study the application form and use it for reference until he is sure he is completely familiar with every item. The next step is to send the completed credit application and copy of the contract to the bank, or the lending institution. The bank will then make a credit analysis. After the loan is confirmed, obviously the next step is for the contractor to do the job. When the job is completed, the contractor is expected to get the customer to sign the FHA Title I completion certificate, and the cash down payment certificate. The contractor then signs the same forms. These certificates, together with the signed note, are then presented to the lending institution, and the lending institution then advances the money to the contractor.

Assistant Commissioner Arthur J. Frentz, in charge of Title I Division, stresses that the Title I program is essentially a cooperative undertaking in which lending institutions and contractors play the main part. Special emphasis is laid upon the contractor's responsibility to carry out his part of the program with good faith. It is impressive to learn that James Hobbs, chief of the dealer control unit of FHA, lays great emphasis upon the fact that less than a fraction of 1 per cent of the hundreds of thousands of dealers who come under the observation and supervision of his unit try to cut corners.

## What Types of Construction Qualify?

Mr. Frentz and Mr. Hobbs suggest that a number of facts about Title I loans be emphasized. The structure to be improved with the proceeds of a Title I loan must exist as a completed building. The repairs, alterations and improvements must be physically attached to the structure in such a way as to become a part of the structure, or be directly connected with it. Examples would include such structural additions or alterations as roofing repairs, including gutters and downspouts; and heating installations and repairs, including furnace, duct-work, oil burners, etc.

In the classification of new structures, loans may be made for the construction of non-residential units, and are eligible for Title I insurance when structures are barns, silos, service buildings, garages, wayside stands, tourist cabins, stores, gasoline stations and commercial or industrial buildings. This enumeration is not inclusive, but offers examples of the types of work financed with

Title I loans. Whenever there is any doubt about the eligibility of a proposed job, it is urged that the lending institution be consulted. Appliances, such as cooking ranges, refrigerators, washing machines, etc., are not eligible for Title I loans.

The FHA Title I chart shows that repairs, alterations, or improvements of an existing structure have a maximum maturity of three years and 32 days, with a maximum amount of \$2500, and a maximum financing charge of \$5 discount per \$100 per year. The added 32 day period is provided in order to permit the maximum of 36, 84, or 180 monthly payments, as the case may be, in the event that there may be two calendar months to the first payment. Maturities are subject to the limitations of credit controls if they are established by the board of governors of the Federal Reserve System.

Alterations, repairs, improvements or conversions of existing structures used or to be used as an apartment house or a dwelling for two or more families, have a maximum maturity of seven years, 32 days and a maximum loan amount of \$10,000, with a \$5 discount per \$100 per year if \$2500 or less, \$1 discount per \$100 if the sum is in excess of \$2500.

In the construction of a new structure to be used exclusively for other than residential or agricultural purposes the maximum maturity is three years, 32 days, at a maximum amount of \$3000, with a \$5 discount per \$100 per year.

Construction of a new structure to be used in whole or in part for agricultural purposes, exclusive of residential purposes, has a maximum maturity of seven years, 32 days. If secured by a first lien, the maximum maturity is 15 years, 32 days. The maximum amount of a loan is \$3000 with \$5 discount per \$100 per year, \$3.50 discount per \$100 if the maturity is in excess of seven years, 32 days.

## Various Aids Available to Dealer

The borrower is required to repay his loan in installments to the lending institution. In most instances the loan installments will come due each month. Certain farm loans may be liquidated by seasonal payments upon appropriate arrangements. It is also suggested that those who wish may secure Title I gross charge and discount tables from the banks or lending institutions, from FHA field offices, or from the Federal Housing Administration, Washington 25, D.C. Apparently any reasonable number will be supplied. The tables give the exact

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rehandling steel stocks!**

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**U**NLOADING and distributing bulk shipments of steel to storage area and then to production and job sites demand added time, manpower and equipment. Eliminate these added costs by letting U. S. Steel Supply deliver your steel to the spot, in the condition and at the time you need it. Fifteen warehouses with the most modern steel handling and delivery equipment assure your complete satisfaction.

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Only **PAYNE** has the new lifetime  
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miracle coating which protects  
jet fighter engines subject  
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protection makes the heating  
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**PAYNE** offers a complete  
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for closet, attic, floor,  
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## WASHINGTON LETTER —

monthly payments for loans in various amounts and of various durations. The form saves much calculation, and enables the contractor to quote to his customer the exact monthly payments necessary.

It also is suggested that contractors who wish to participate in Title I program operations should thoroughly familiarize themselves with Title I regulations. The entire picture of Title I proceedings is given in great detail in a publication prepared by the Federal Housing Administration entitled, *Dealer Guide for FHA Title I Loans*. The guide may be obtained by writing to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.; the price is 5 cents. The office does not accept stamps. Refer to edition FH 30A, rev., April, 1951.

Another useful reference for the dealer is *FHA Form No. 147*, revised June, 1953, listing the directors and locations of the FHA offices in the 48 states, Washington, D.C., Hawaii, Puerto Rico, and Alaska. For this form, write the FHA, Washington 25, D.C.

### "Open-End Mortgage" Easy on Borrower

There are frequently inquiries as to what should be done if a client is wary about negotiating a loan for improvements, or for other building operations, because he feels he is using all his savings for a down payment and to obtain furnishings, and fears he can't save enough to make the essential repairs and improvements in the future when they may be necessary. Authorities here say the open-end mortgage is the answer. It costs no more than any other mortgage. It keeps the monthly payments low — at least 50 per cent less than a separate modernization loan on top of the regular mortgage.

Here's how it's done. The borrower arranges with the bank a \$10,000, 20 year mortgage, for example, at the current interest rate. He signs the usual papers, including the mortgage. But this mortgage is a little different from the standard mortgage; it has a special clause — generally called a "to secure" clause. This clause in effect says that the borrower has given the mortgage to secure not only the original debt but also any additional advances that may be made to him — not to exceed a specified amount, and in no event over the original face amount of the mortgage. This is the result: The borrower, at any time, can reborrow — up to the specified maximum — whatever money he has paid off on the principal of the mortgage. Thus, if the borrower has paid off \$2000 on the principal, he can reborrow the \$2000 and use the money to make those repairs or improvements about which he worried earlier.

To reborrow the money, he merely files an application with the bank. When the application is approved he is called in, signs a supplemental mortgage for \$10,000 — \$8000 balance plus \$2000 reborrowed — and gets his check for the full amount.

In this instance, the borrower pays no heavy fees and charges. When he reborrows that \$2000 he pays, ex-



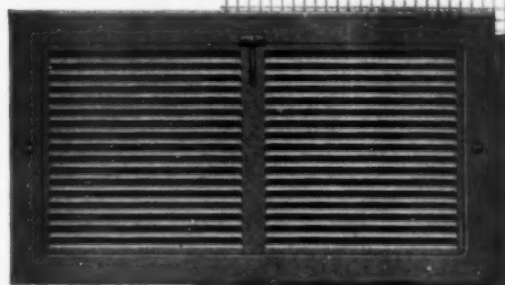
# *Auer* fills all your Register needs FROM ONE RELIABLE SOURCE

Why not take advantage of the time-saving convenience of filling all your register needs from the complete dependable line made by The Auer Register Co.? Here are registers and grilles for all purposes—gravity or air conditioning.

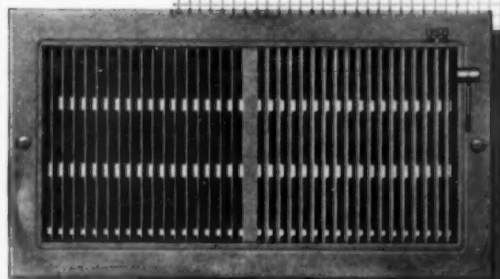
## *Auer* **REGISTERS** **QUALITY CONTROLLED PRODUCTION**

When you install Auer registers, you have the assurance of accurate dimensions and uniform high quality—the result of Auer's system of strict quality control of production.

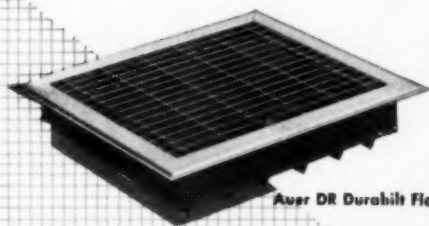
*Write for the 30-page Auer Register Book for complete information.*



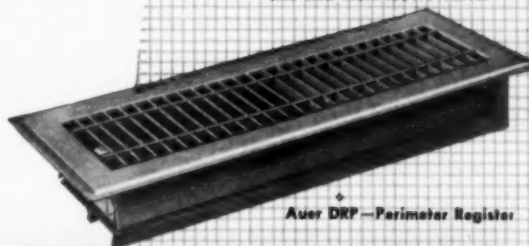
Auer No. 7032 Register with flexible fins and single valve



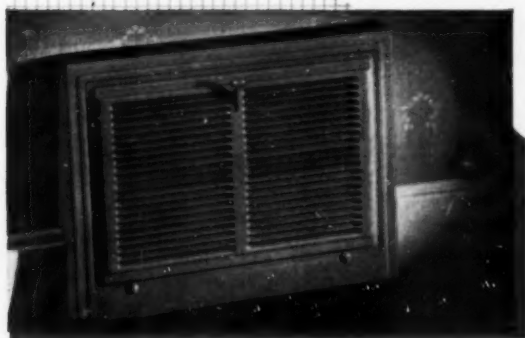
Auer No. 4432 Register with flexible fins and multi-leaves valve.



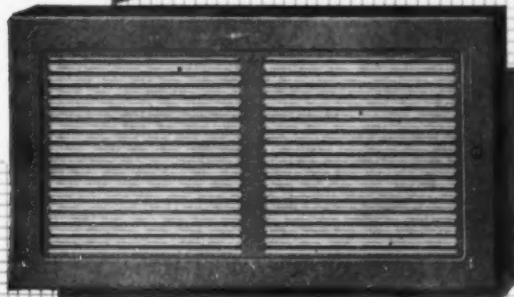
Auer DR Durabilt Floor Register



Auer DRP—Perimeter Register



Auer H-800 Heat Site Baseboard Register



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wall heater installations  
comply with  
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WALL-VENT

Listed and approved by Underwriters' Laboratories, Inc. as a Type B-W gas vent for installation with recessed wall heaters.

The American Gas Association now requires that recessed wall heaters be marked specifying the type of vent to be used. In addition, Underwriters' Laboratories has established a new designation, Type B-W, applying to vents specifically approved for use with recessed wall heaters. Compliance with these requirements will insure better, safer venting and help to eliminate customer complaints resulting from faulty installations.

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**METALBESTOS WALL-VENT IS  
APPROVED FOR INSTALLATION INSIDE  
2" X 4" COMBUSTIBLE WALLS**

- No Furring Out Required
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Metalbestos Wall-Vent, the first and leading gas vent specially designed for venting wall heaters, meets all A.G.A. and U.L. requirements. Its insulated double-wall design assures proper venting and protects walls from dangerous overheating. Made of rust-proof aluminum, it resists the corrosive action of vent gases, lasts the lifetime of the house itself.

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Based on the latest gas venting research, this pocket-size booklet contains complete, up-to-date information on venting practices plus many helpful installation tips. Write today to Dept. 8

**WASHINGTON LETTER —**

clusive of legal fees (which are nominal) \$24.50 in fees and charges, as follows: Title search, \$10; recording mortgage, \$4.50; mortgage stamp tax, \$10. That's not very much when it is considered that the same fees for a \$2000 mortgage were formerly about \$80.

Actually, the open-end mortgage is not a very new idea. However, until recently, banks wouldn't use it because of the cost of the new title search. There being already a title policy outstanding, the insurance company now simply takes an affidavit from the mortgagee that there are no intervening liens since the date of the original title policy.

**Title I Advisory Group Formed**

To advise Commissioner Hollyday on home repair and improvement financing under Title I loans, and to further FHA's policy of working closely with private industry, a new group of specialists has been formed. The group, which met for the first time on June 22, includes: J. O. Elmer, San Francisco; E. F. Longinotti, Memphis; Richard D. Mange, Detroit; J. Andrew Painter, New York; G. M. Robbins, St. Paul; Richard H. Stout, Louisville; and Kenneth R. Wells, Chicago. Each has had experience in the fields of banking and finance.

When he announced the nucleus of the group, Mr. Hollyday stressed that as the program develops in the months ahead, other specialists, both in home repair financing and in the sale and distribution of repair and improvement materials, will be asked for advice.

**New Head for Public Housing Administration**

The President, early in June, nominated Akron's mayor, Charles Edward Slusser, as head of the Public Housing Administration. Mr. Slusser, from 1944 to 1953 the mayor-manager of that city, started his career in Akron as construction superintendent for the Firestone Tire and Rubber Co. He is president of his own insurance and real estate agency.

As Public Housing Administrator, he will supervise the Federal Government's participation in the low rent housing program. Whether or not there will be an expansion in the authority to permit the building of 35,000 more units depends on the results of conferences between the Senate and House committees. The Senate approves of more low rent housing; the House is, in general, strongly opposed to it. Representative Ralph Gwinn (R., N.Y.) recently told the House that already public housing programs are the reason for the employment of 1,500,000 people. He thinks expansion of the program would increase the number by another half million.

Over 200,000 homes are now operating under the low rent program in about 300 localities. Something like 820,000 public housing units in more than 1000 additional localities may be authorized under existing circumstances. Of these, preliminary loans so far have been made by the Federal Government for approximately 300,000 units.

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for furnaces and air conditioning units

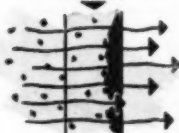
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## SELL THE AIR FILTERS YOU'D BUY YOURSELF

Engineered by AAF—acknowledged leader in air filtration.



FILTER



Catches "Nuisance" Dust—holds it inside where it can't pack on the filter face and clog air passages.

Smooth to touch—no prickly slivers, no unpleasant odor, no greasy feel.



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Sell the filter that's "hospital white," that actually invites sales when you display it on your counter for your customers to see and touch. AMER-glas filters look clean and sanitary—outsell other leading brands on eye appeal alone.

Four out of five warm air furnaces now being installed are forced air units . . . and leading domestic air conditioning units come equipped with AMER-glas filters. Stock AMER-glas filters, display AMER-glas filters, sell AMER-glas filters—for easy, extra profits you may be missing now.



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FLOOR FURNACE

OFFER YOUR CUSTOMERS  
JZ BRAND HEATERS!



### Why JZ Heaters Are Money Makers

**HIGH PROFIT**—JZ Heaters bring a high margin of profit because less time is spent selling customers. JZ Heaters almost sell themselves.

**EASY INSTALLATION**—JZ Heaters are known for their ease of installation, takes only a short time when compared to other heating units.

**EASY TO SERVICE**—While compactly and sturdily built, all parts of a JZ Heater are easily accessible. Rarely are parts replacements needed.

### JZ Heaters in Four Popular Styles

**FLOOR FURNACES.** JZ gas fired floor furnaces are available in five conventional and short models with input ratings from 30,000 B.t.u./hr. They become a complete one-package heating unit when equipped with safety pilot and automatic temperature control.

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**UNIT HEATERS.** Model UHS Gas-fired, fan type suspended heater. Completely automatic. Available in two styles, attractively finished, quiet, safe and easy to install. From 44,000 B.t.u./hr.

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## JOHN ZINK COMPANY

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Compare the fireplaces and stoves of that day with modern central heating plants. Today's furnaces are marvels of efficiency in converting gas, oil and coal into clean, even heat that reaches every room.

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been designing and producing motors for mechanical-firing and air-moving heating units. Many of the most famous names in the heating industry depend on Emerson-Electric motors for efficient, long-life operation for their products.

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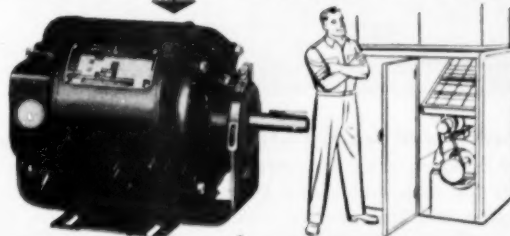
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**EMERSON**  **ELECTRIC**  
MOTORS • FANS APPLIANCES

LEADERS IN THE MOTOR AND FAN INDUSTRY SINCE 1890

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Asbestos-Cement Pipe has been  
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Transite\* Flue Pipe is performance-proved in venting domestic gas-fired appliances. It has been included in the codes of cities from coast to coast—and it is the *only* pipe which has been continuously listed by Underwriters Laboratories since 1932, for use as a Flue and vent pipe for domestic gas-burning equipment.

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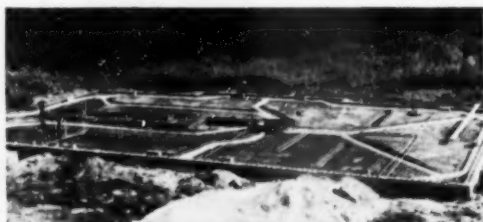
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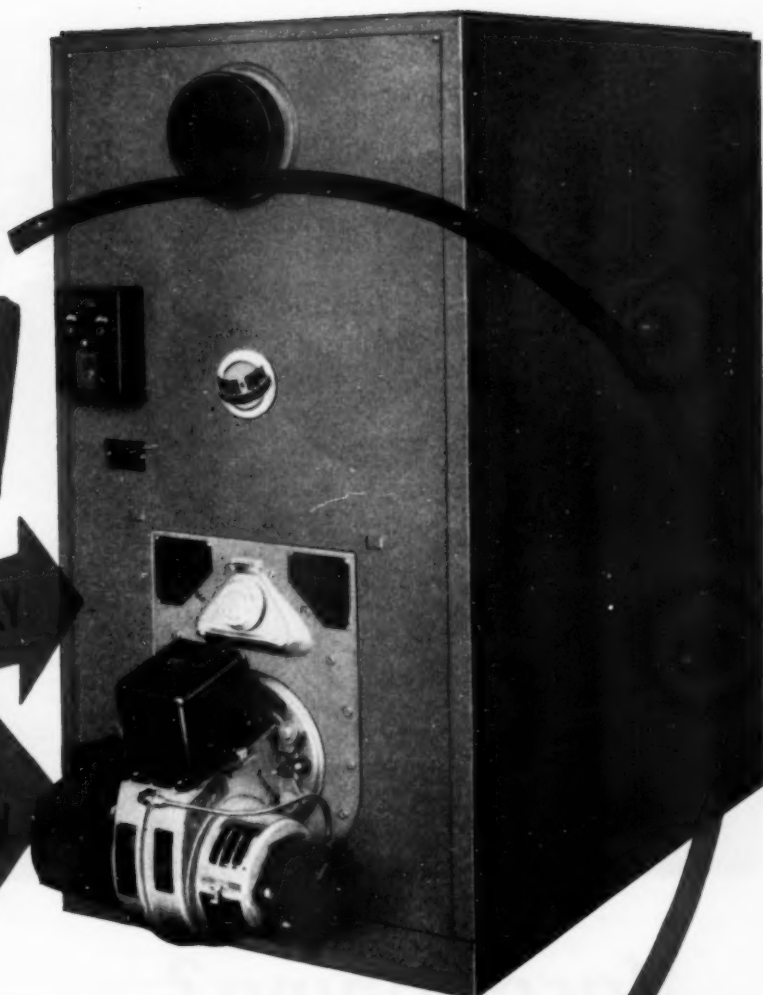
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FOR VENTING DOMESTIC GAS BURNING APPLIANCES

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READY FOR DELIVERY

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☐ Distributor ☐ Dealer ☐ Installer  
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(Photograph Courtesy Canadian National Railways)

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## To Avoid Losses — First, Find Them!

"DURING 1951 I was much too busy to take a vacation, too busy to spend an evening enjoying television, and frequently too busy to visit even briefly with my industry friends, who called on me at the shop. I was busy making more furnace installations than ever before in the history of my company, and — I thought — making more money than in any previous year. But when the company books were balanced at the close of the year the profits I had expected were not there." This was the way one warm air heating contractor explained why he had taken stock of himself and his business operation.

Looking through previous years' records, he noted that there was more profit at the end of the year for each of those years when he had watched business closely and had concentrated his efforts on producing high quality work.

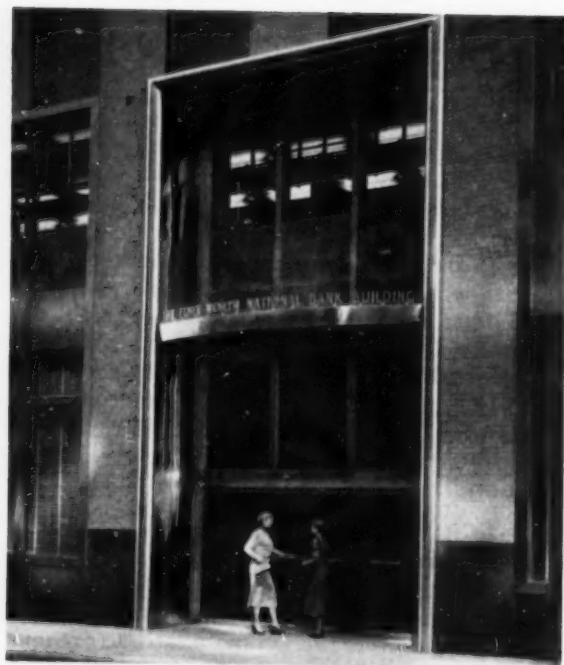
His self-examination led him to realize a most important fact — an increase in volume does not always indicate an increase in profit. He resolved that in 1952 he would take the time to examine the cost of doing each job, and in this way he could locate where his spending was excessive. He found that losses occurred when there was a lack of a production schedule, when material was wasted, and when extra rental was paid on special tools not returned after they were no longer needed. He, in addition, was paying more interest on borrowed capital because he failed to repay the loans as soon as he could, and paying more to subcontractors whose bills exceeded the original estimates. Last but not least, the number of callbacks necessary after the job was completed frequently exceeded the anticipated number.

Therefore, a close examination of each job after it had been completed was made a habit, and an employee training program aimed at eliminating material wastage, etc., was inaugurated. Also, included with bids were written recommendations that would make the job more satisfactory upon completion, tending to make the bid price seem to be more in line with a quality job.

All of these procedures seemed to be quite time-consuming at first, but once the program began to function, the contractor found that less of his time per job was required than in previous years. He has spent this time to advantage. He has taken on an additional line of merchandise — summer cooling. He has built a wider industry acquaintance, is meeting more prospective customers — and he's made more money.



1 inside . . .

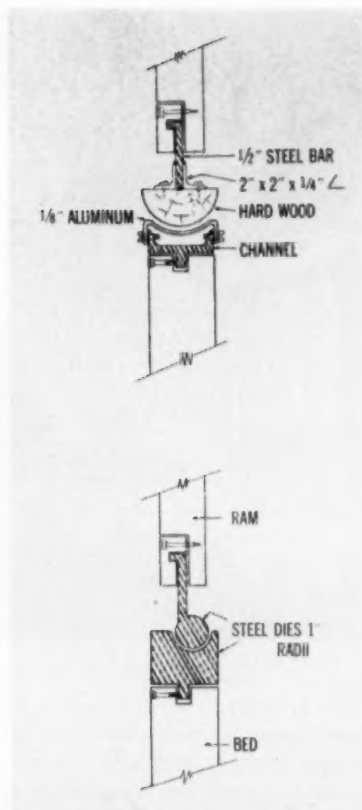


2 and out . . .

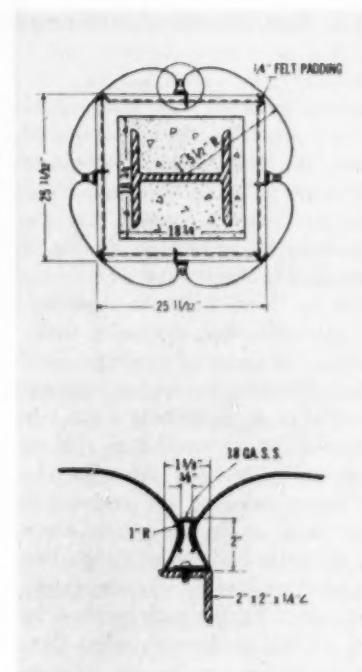
## A Bank Wears Stainless Steel



... for protection and eye appeal. Described here in detail are a special coping, column sheathings, the stairway railing, and a novel method devised by the contractor for making bends in Type 430 stainless



3 SPECIAL PRESS brake dies were used . . .



4 TO FORM the sheathing for the main lobby columns

## E. M. Rains Armco Steel Corp.

MORE THAN 32,000 pounds of stainless steel sheets and bars have been used to make the new Fort Worth National Bank an attractive and enduring structure. The Monday Mfg. Co. of Fort Worth developed new designs and new methods of fabricating the steel for this project. Entrances, door trim, lobby trim, vault entrances, interior columns, etc., were fashioned from stainless steel in the Monday shop.

The bank quarters cover 110,000 sq ft of space, including 27,500 sq ft on the ground floor. The building faces on three streets — 125 ft on Main St., 200 ft on W. 7th, and 150 ft on Houston St.

The W. 7th St. entrance (at left, Fig. 2) is three stories high and displays both a horizontal and vertical expanse of curved and highly polished stainless steel. Directly over the street entrance is a rounded marquee of stainless for weather protection. On the top front edge of the marquee, three-dimensional letters spell out the name of the building.

First floor windows are plate glass framed in stainless steel. Windows above the W. 7th St. entrance are trimmed with 14 gage stainless, used for most of the exterior trim and entrance canopy. All joints were welded, ground smooth, and blended. The soffit over this entrance is constructed of 14 gage stainless steel welded to facing plates. On this same entrance 14 gage stainless was used for framing the transom and as sheathing for the entrance side walls.

The Main St. entrance has broad and gently receding walls of Missouri granite in a rich shade of brown. The walls recess from the street to a double set of six doors framed, like the vestibule, in stainless steel. The marquee sign letters of 2 x 2 in. channel and the front of the marquee complete the stainless work on this entrance. The canopy trim is 14 gage stainless.

A third entrance is on the Houston St. side (center, Fig. 2). Instead of

(Please turn to page 132)

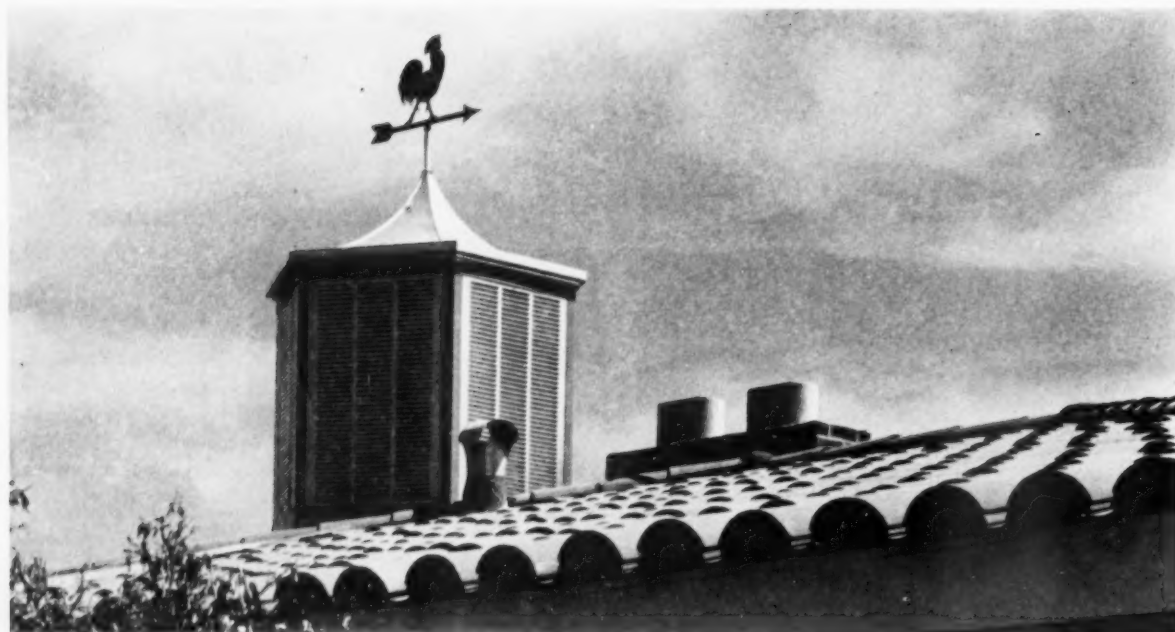


FIG. 1—ROOFTOP INSTALLATIONS of evaporative coolers can be blended in effectively with the architecture of the home

# How Evaporative Cooling Works

**Robert S. Ash, Professional Engineer**

**Using a psychrometric chart, the author explains how evaporative cooling reduces room air and effective temperatures. A method is given for calculating the maximum wet and dry bulb temperatures satisfactory for this type of cooling**

COOLING BY EVAPORATION of water is as old as mankind and represents the oldest practical application of air conditioning principles. While the origin of evaporative cooling is not definitely known, it seems to have been developed independently in many countries and as long ago as Biblical times. Historical accounts of the ancient Egyptians, the Indians, the Chinese, and others il-

lustrate methods of evaporative cooling involving the sprinkling of water on reed carpets that closed entryways to living chambers. Natural air currents passing over the wetted surface caused evaporation of water and cooling of the air.

On the North American continent, the early Mexicans devised a clever form of evaporative cooling called *Olla*. The *Olla* was an earthenware jar used to store drinking water. It was made of porous baked clay to allow water to seep through. As the water came to the surface, it evaporated, cooling the jar and keeping the water cool and palatable. The wet sheet or blanket was also extensively used by the early settlers in arid regions of America when they desired to sleep in the hot summer daytime.

Pioneers copied the principle of

the *Olla* when they built food coolers consisting of an open frame with shelves along the sides. Over the frame they tacked burlap and on the top they placed a pan with small holes punched around the bottom edge. This allowed water to seep down the burlap and keep it moist. When placed in a breezy spot, the wind blowing through the damp burlap caused evaporation which cooled the food on the shelves.

With the building of permanent homes in the hot, arid Southwest, this crude food box and cooler was made more elaborate. Then, someone got the idea that by placing similar apparatus in a window of his home, he might be able to cool a whole room. Later, other builders of these home-made coolers began using the family fan to draw air through the wet pads and force it



into the room. From this humble beginning, the manufacture of evaporative coolers in the past 20 years has grown into a thriving industry. Fig. 2 shows a typical blower type cooler of 3500 cfm size as it is made today.

### Why Evaporative Cooling Works

The modern evaporative cooler creates comfort for five basic reasons:

- 1) The evaporation of water cools the air.
- 2) Rapid motion of the air lowers effective temperature.
- 3) The cool air reduces heat transferred to the human body.
- 4) 100 per cent fresh air is stimulating and vitalizing.
- 5) The cooler also eliminates dust, pollen and foreign matter.

The last three reasons are self-evident; however, points one and two, which are the primary reasons for the success of evaporative cooling, have always been somewhat of a mystery. Let us examine these two points more closely. Through a good understanding of them, it will also be possible to determine the suitability of evaporative cooling for any climatic condition.

### Converting Sensible to Latent Heat

One of the air conditioning principles that seems most difficult to understand is cooling through evaporation of water or the theory of adiabatic saturation of air — as it is known in the science of thermo-

dynamics. This theory, which was first rationally expressed by Dr. W. H. Carrier, is based on the conversion of sensible heat (heat that is indicated by a thermometer) to latent heat (heat that is not indicated by a thermometer but that exists within water vapor), while the total heat remains constant.

If a continuous quantity of air at a high dry bulb temperature (the temperature reading associated with an ordinary thermometer) and a low dew point temperature (the temperature to which the air must be lowered to obtain 100 per cent relative humidity or cause water to condense from the air) is passed through a wetted pad or dense spray of water, the air leaving the wetted pad or spray will be saturated (100 per cent relative humidity) and will be lowered to the wet bulb temperature of the air (the temperature measured by a thermometer to which is added a wetted wick over the thermometer bulb). The heat required for the evaporation of the water is removed from the air by cooling the air from the entering dry bulb temperature to the leaving saturated condition or wet bulb temperature.

This conversion of heat may be illustrated by the transfer of energy or heat that takes place in boiling water on the stove. We have all observed that while a certain amount of heat is needed to bring water to the boiling point, considerably more heat is consumed in boiling the water away. (1 Btu will raise 1 lb of water 1 F, but 970 Btu are needed to boil away 1 lb of water after it has been raised to 212 F.)

The evaporation of water occurs when the liquid is placed in contact with air that is less than 100 per cent saturated. The air supplies the heat to accomplish this. In this process, approximately 1000 Btu are extracted from the air to evaporate 1 lb of water.

Put in another way, the removal of sensible heat from the air causes the dry bulb temperature to become lower. This is brought about because the heat required to vaporize the water in the cooler must be obtained from the supply air. Here, sensible

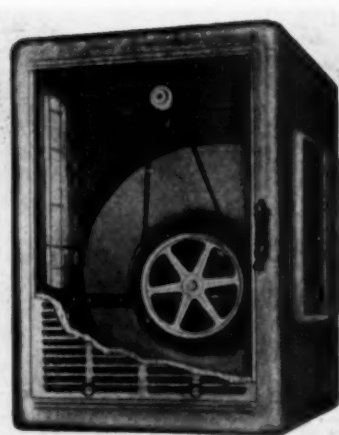


FIG. 2—THIS TYPICAL blower-type cooler of 3500 cfm size is the descendant of the moistened reed carpets of ancient times

heat is converted to useful work, and in the process, it achieves the objective of a lower air temperature. It takes about as many Btu to vaporize 1 lb of water as it does to melt 7 lb of ice.

### How Room Temperature Is Lowered

Let us now examine the psychrometric chart in Fig. 3 to see what this means in terms of cooling air by the evaporation of water. Assume that the dry bulb temperature of the entering air to an evaporative cooler is 100 F and that the relative humidity is 30 per cent. Entering the chart at A and following the diagonal line until it intercepts the 30 per cent relative humidity line at point X, we find that the intersecting vertical wet bulb line is identified at the bottom of the page as 74 F at point B. To find the dew point, the diagonal line crossing point X is followed to point C on the curved 100 per cent humidity line, then diagonally, to point D. The dew point is 63 F. The total heat content of the air is related to the wet bulb temperature, and for 74 F, is 37.7 Btu per lb of dry air, as shown in the bottom line.

As the air passes through the cooler, which we shall assume in this illustration to be 100 per cent efficient, it will become saturated with water, and we read from the chart a dry bulb temperature of 74 F, 100 per cent relative humidity, a dew point

### WHY'S AND HOW'S OF EVAPORATIVE COOLING

This is the first in a new series covering evaporative cooling. Articles to come will describe:

- ▶ Types of coolers
- ▶ Cooler design and construction
- ▶ Sizing the cooler
- ▶ Design of cooler installations
- ▶ The cooler industry and its sales

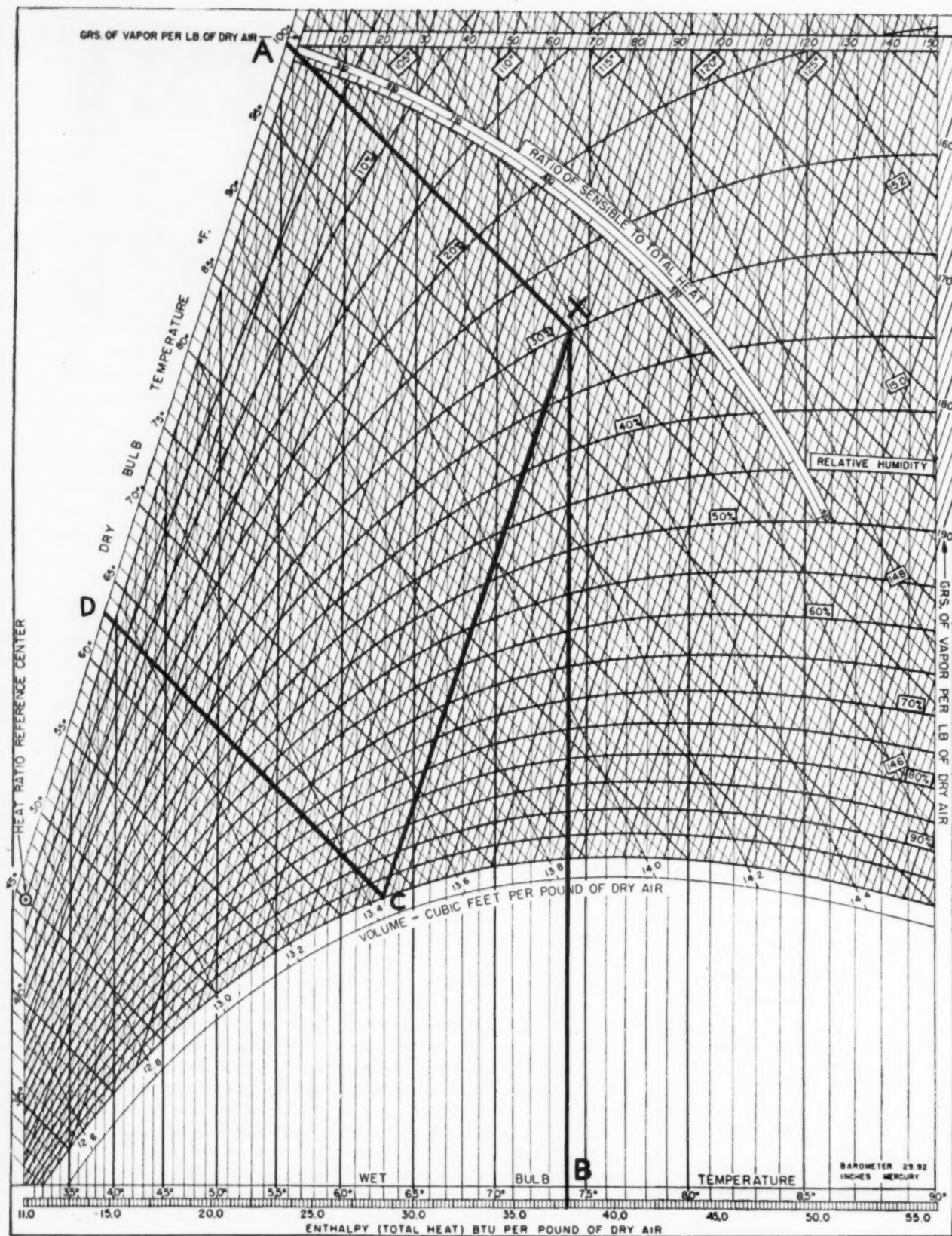


FIG. 3—FROM EXAMINATION of the psychrometric chart, we see that the evaporative cooler lowers the actual room temperature

temperature of 74 F, approximately 9.20 grains of moisture per cu ft of air and no change in the wet bulb temperature of 74 F, and the heat content of 37.8 Btu per lb of air. Without adding or extracting heat, the evaporative cooler has reduced the temperature of the air from 100 F to 74 F through evaporating or boiling away enough water in the pads or spray to saturate the air with moisture. Thus we see that the evaporative cooler provides a flow of cool air that lowers the actual room temperature.

### Reducing Effective Temperature

The other principal reason given for creating comfort was the reduction in effective temperature. What is meant by the term *effective temperature*? Experiments made on a large number of human subjects have demonstrated that there is a consistent relation between the temperature, humidity and air motion in their effect upon comfort. Effective temperature is an index that combines into a single value the effect of these factors on the degree of warmth or cold felt by the human body and is the only known true index of human comfort. This means that for a given dry bulb temperature and humidity, effective temperature is lower for moving than for still air, as the rapid motion of the air increases skin surface evaporation.

Tests show that increasing the air motion from 25 fpm to 300 fpm will permit an increase in dry bulb temperature from 69 F to 73.5 F, with no change in the corresponding effective temperature. Or conversely, this represents a decrease in effective temperature of 4.5 degrees when there is an increase in air motion from 25 fpm to 300 fpm with the temperature and humidity remaining constant.

In typical evaporative cooler installations, the outlet velocity in the area to be conditioned is seldom below 1200 fpm. We know that this primary air supplied through the outlet picks up room air at the outer surface of the air stream. Experiments indicate that this induction of room air occurs at substantially con-

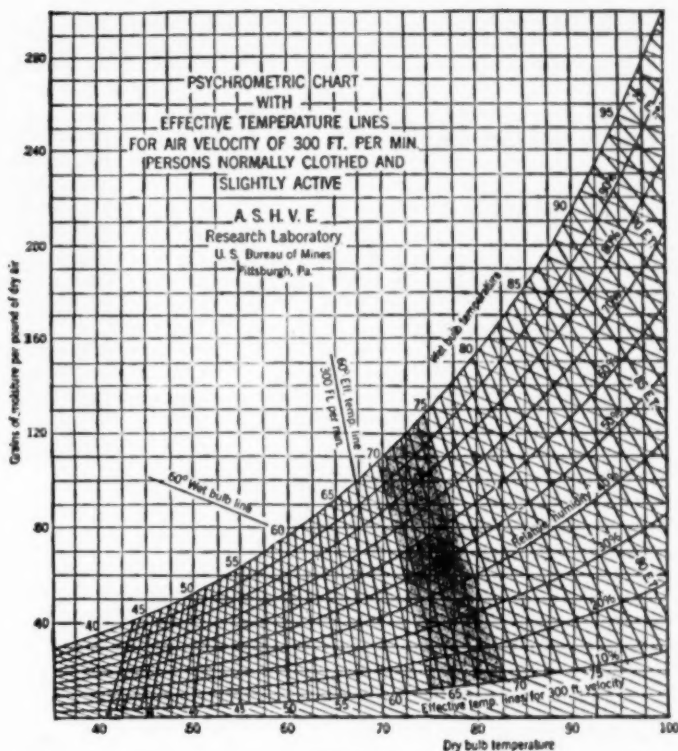


FIG. 4—THIS EFFECTIVE TEMPERATURE chart shows the normal scale of effective temperature, applicable to inhabitants of the U.S. under certain conditions (indoor clothing, sedentary or light work, etc.).

stant momentum until the average velocity of the air drops below 200 fpm. This means that six times as much air may be set in motion through the reduction in velocity of the primary air stream with a resulting air movement in the space to be conditioned of 100 fpm to 300 fpm.

### Design Wet Bulb Temperatures Calculated

We are now ready to determine a rational method for calculating approximately the various maximum summer design wet bulb temperatures that are satisfactory for evaporative cooling. Table 1, taken from the American Society of Heating and Ventilating Engineers' *Code of Minimum Requirements for Comfort Air Conditioning*, Transactions ASHVE 1938, gives an effective temperature range of 71 F to 75.5 F.

The chart in Fig. 4 can be used to find effective temperature relations of certain combinations of air conditions. An effective temperature

Table 1—Design Conditions for Air Conditioning Systems

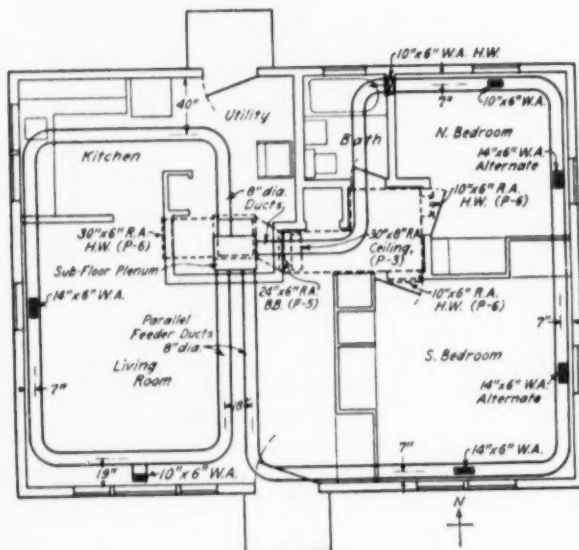
Design Outside Dry Bulb Temperature	Design Inside Effective Temperature
105	75.5
100	75.0
95	74.0
90	73.0
85	72.0
80	71.0

line for an air velocity of 300 fpm is not uncommon in evaporative cooler installations. It is recognized that extremely high humidities in summer are not comfortable and must be avoided if at all possible. To achieve satisfactory conditions within a home, the maximum relative humidity should probably not exceed approximately 65 per cent. From Fig. 4, it will be observed that to obtain an indoor effective temperature of 75 F when the outside design temperature is 100 F, we must have a dry bulb temperature not exceeding 85 F, a wet bulb temperature not exceeding 75.3 F and relative humidity of 65 per cent. Now assume that the evap-

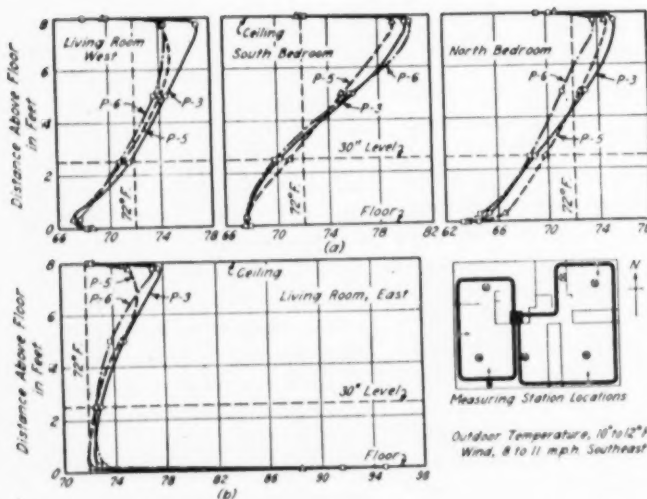
(Please turn to page 134)



# 1 Heating a Slab Floor House



## 2 With a Two Loop System



3 . . . PROVIDED RELATIVELY low room air temperature gradients, except in the kitchen and bathroom



Studies in Research Residence No. 3 at the University of Illinois indicated that the location of warm air registers was far more important than that of the returns, and that warm floors could be maintained with a two loop perimeter system. These studies were used as guides for further experimentation and improvement in comfort conditions

**R. W. Roose and S. Konzo**  
University of Illinois

ONE OF the most promising systems studied in the field by the Field Investigation Committee of the National Warm Air Heating and Air Conditioning Association during the 1948 season was the two loop, warm air perimeter heating system. These field studies were not of sufficiently long duration to permit a complete survey of heating plant performance under a wide range of weather conditions. The research advisory committee of the association decided, therefore, to build a research residence upon a concrete floor slab. Plans were completed in the spring of 1949 to build Warm Air Heating Research Residence No. 3 at Urbana, Ill., and the construction was completed in September.

The new Residence (Fig. 1) was a single story, low cost home with a concrete slab floor. It was of standard frame construction, provided with a vented attic and with a relatively large glass area. No storm sash, weatherstripping, or wall insulation were incorporated into the house, since the studies were to be devoted to low cost construction as commonly experienced in the field. The ceiling was insulated with 3½ in. mineral wool batts, and the outside doors were provided with storm doors.

A floor plan of the Residence is shown in Fig. 2, together with the perimeter heating system investigated during the 1949-50 heating season. The Residence was 24 x 32 ft, with a floor area of 768 sq ft. The design heat loss for an outdoor temperature of -10 F and an indoor

temperature of 70 F was about 51,600 Btu per hr. In this first perimeter system, the 8-in. diameter ducts were embedded 2 in. below the top of the slab, and were installed in the form of two loops which enclosed a major portion of the floor area. The warm air was delivered downward from the bonnet of the highboy furnace through an insulated duct into a subfloor plenum below the furnace. The air was then forced outwards to the perimeter ducts and to the floor registers. After entering the rooms, the air moved across to the return-air intakes near the center of the house and into the furnace to be reheated.

The slab floor construction shown in Fig. 4 consisted of a 4 in. gravel fill placed on the original grade, and 4 in. of concrete. The edge insulation consisted of a 25/32 in. asphalt-coated fiber insulating board placed against the foundation wall and extending downward 12 in. from the top of the slab. An 8-in. diameter sheet metal duct was embedded in the slab at the edge.

Three main studies, designated as Series P-3, P-5, and P-6, shown in Table 1, were conducted. The only difference in these three series was in the arrangement of the return-air intakes. In all cases the systems were operated in accordance with the continuous air circulation principle, that is, with relatively low cut-in and cut-out settings of the fan switch and with relatively low rates of air flow.

#### **Temperatures Uniform**

The cyclical variation of room air temperatures was small, amounting to about 0.5 F in the living room. Also, the response of the system to sudden changes in outdoor tempera-

(Please turn to page 127)

## **How We Got Where We Are In WARM AIR**

### **PERIMETER HEATING**

the seventh in a series planned to tell about:

► Investigations in the Research Residences at the University of Illinois

► Design and installation data (condensed from manuals published by the National Warm Air Heating and Air Conditioning Association)

► Specific phases of warm air heating

... in articles so far:

► heating basementless homes

► warm air ceiling panels

► heating slab floor homes with ceiling and floor panel systems

► floor panel-convection heating for slab floor homes — partially open and completely open

► survey of field practices

► new research residence built

... in articles to come:

► comparison of two loop perimeter and three convection systems

► comparison of perimeter loop and two loop system

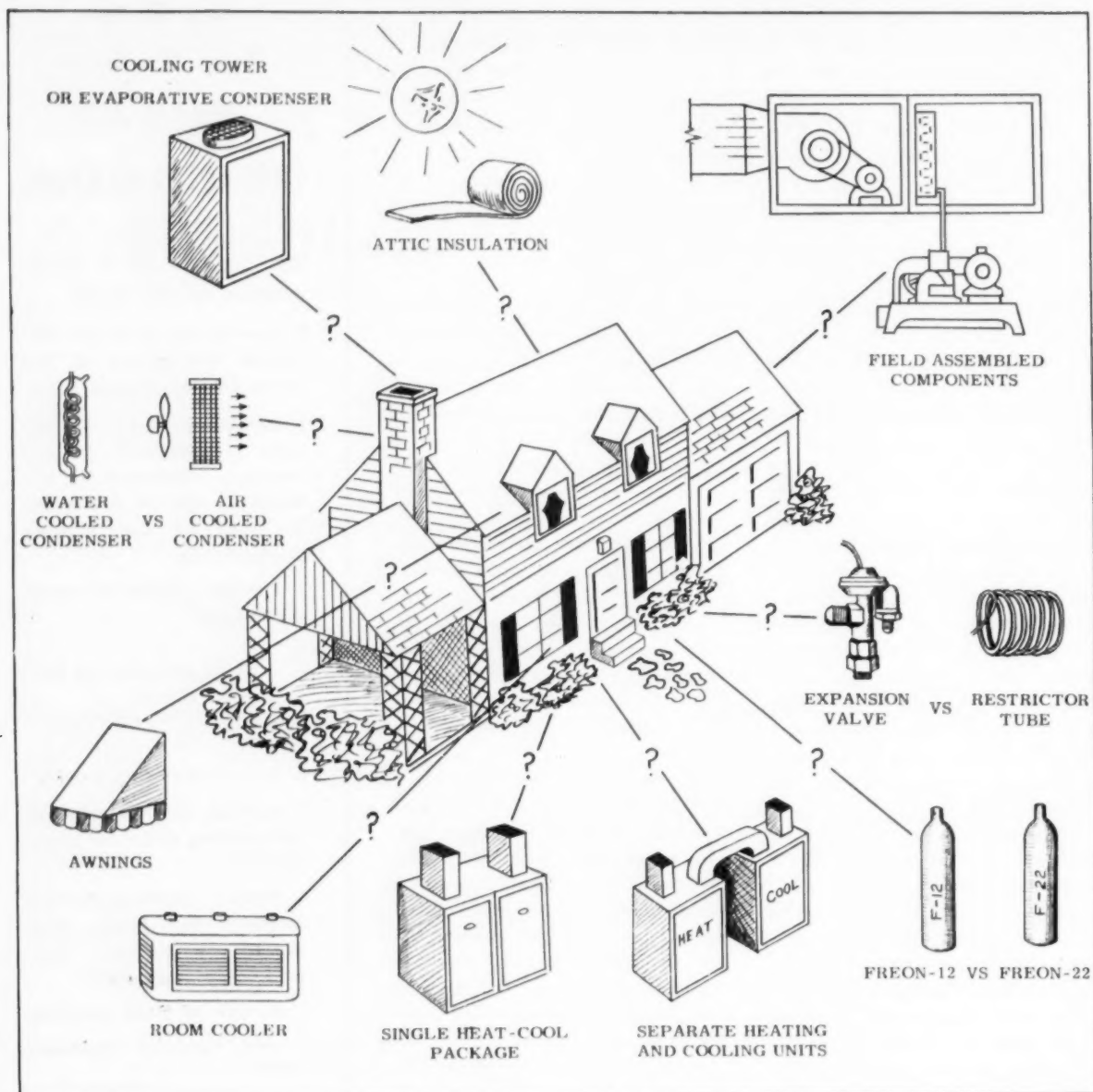
► perimeter laboratory studies

► crawl space heating

► 8 in. loop system vs. 6 in. loop system

► loop vs. radial system

This article is condensed from a complete report in University of Illinois Engineering Experiment Station Bulletin 403, *Comparative Performance of Two Warm Air Perimeter Systems and Three Convection Systems*, by M. E. Childs, R. W. Roose, H. T. Gilkey, and S. Konzo, Figs. 2 through 5 are from this bulletin.



# How to Select Cooling Equipment

**S. W. Reid**  
Air Conditioning Engineer  
Gilbert Associates, Inc.

## Which plan?

- individual room cooling?
- central station cooling?
  - with minimum ductwork?
  - using existing ducts?
  - using new ducts?

## Which equipment?

- factory-built or field assembled?
- belt-driven or hermetic?
- air-cooled or water-cooled?
- "Freon-12 or "Freon-22"?
- combination or separate packages?

THERE ARE two points of view on equipment selection which must be assumed by the dealer. First, he must see the customer's problem in order to help decide on the air conditioning plan to be followed. Second, he must survey the equipment that is available and train himself to evaluate its basic features and characteristics.

When a man is ready to buy air conditioning for his home he will usually need some guidance before he can definitely tell a dealer exactly what he wants. It is certainly the responsibility of the dealer to prepare himself to give the information needed by the home owner in making a decision. Such things as the effect of ceiling and wall insulation or the effect of awnings and roof overhang will be of interest to the new home builder if he can, by proper use of these, save on equipment size or operating expense.

Proper guidance takes into account what a man can afford to invest in equipment and what he will have to spend to operate it. Such things as typical power, water, and sewer costs must be made a part of discussions leading to the determination of what a man wants in residential cooling.

In an existing house, studies must be made of power facilities, water and sewer availability or possible cooling tower or evaporative condenser location, duct adequacy or possibility of installing ducts if the existing heating system is not warm air, supply and return grille locations, and equipment location. These are but a few of the items which must be considered.

#### Can Propose Four Basic Plans

Actually, the dealer can pave a road toward customer decision by proposing four basic plans for using air conditioning in a residence. These are, in order of increasing cost:

**1.** Individual room cooling with window or console type units (probably not lowest in cost if entire home is to be cooled).

**2.** Central station cooling requiring a minimum of supply ductwork. Air

is returned through hallways and open doors. The unit is sized for selective cooling. It is not large enough to cool the entire house at one time but will do either bedrooms or the living-dining room separately.

**3.** Central station cooling using heating ducts. The unit is sized to do the entire house if kept running continuously during peak or near peak load conditions. There may be some dry bulb slip upwards at peak periods, but the unit will be adequate and economical for almost all of the cooling season.

**4.** Central station cooling using properly designed ductwork and properly sized and located grilles. This is the "deluxe" job designed and guaranteed to hold certain conditions inside the home regardless of outside temperatures.

To meet the first plan there is an increasing variety of units available ranging from 1/3 through 1 hp. Room coolers have a number of advantages in residential work. They are relatively low in initial cost. They are also simple to install (need only a power supply, no duct alteration, distribution grilles, or plumbing being required). They are portable, can be moved easily when the owner moves or removed temporarily for winter storage. Finally, they can be purchased one at a time, permitting enjoyment of air conditioning without large initial outlay.

There are, however, some disadvantages. Window-type units are rather unsightly outside for residences, and they cut off window area on the inside. Noise level is likely to be higher in the room than with a central unit. In addition, only one room can be cooled per unit; excess capacity on off-peak days cannot be used effectively to cool other rooms. Automatic control is not as satisfactory as that available for central station systems.

Finally, due to compact arrangement and small motor sizes, room coolers are not likely to be as economical to operate per ton of cooling as are larger units for central cooling.

## Air Conditioning Fundamentals

This is the 11th in a planned series of articles devoted to the fundamentals of air conditioning systems for summer and winter, and providing specific information on all the component parts. Special emphasis is placed on how to adapt cooling to warm air heating systems.

#### Articles So Far:

1. The terms used in the air conditioning field, i.e., air properties, comfort conditions, etc. (September issue)
2. The parts of the refrigeration system and how they work (October issue)
3. How to estimate cooling loads (November issue)
4. How to achieve proper air stream patterns in the conditioned space (December issue)
5. Duct design — comparison between sizing for summer and winter (January issue)
6. Condensing units (February issue)
7. Fans, fan motors and fan speeds (March issue)
8. Filters — throwaway, cleanable, electronic (April issue)
9. Condensers and water regulating valves (May issue)
10. Cooling towers and evaporative condensers (June issue)
11. Equipment selection (this issue)

#### Future Articles:

1. Electrical control systems
2. Electric controls
3. Sample problem — estimating cooling load and selecting equipment
4. Second sample problem, using different building and conditions
5. Trouble shooting — detecting malfunctioning of summer air conditioning equipment (two articles)
6. Replacement procedures for defective parts in cooling equipment (two articles)

## Getting Most Capacity

The second plan listed goes one step beyond the first. Instead of using room coolers which must be located near windows to obtain outside air for their condensers, plan 2 makes use of small, compact units with water-cooled condensers. These units may be installed in centrally located closets, in attic spaces above ceilings, or in crawl spaces beneath floors. The total installed capacity under plan 2 may be no more than that provided by one or two room coolers, and yet, because plan 2 calls for a certain minimum amount of ductwork, the installed capacity can be used more effectively.

Suppose, for instance, that a small, one floor home having three bedrooms and a living-dining area is cooled according to the first plan. Let us say two of the bedrooms have  $\frac{1}{2}$  hp room coolers, making the total installed capacity in the home 1 hp. With this arrangement, the only areas that can be cooled effectively are the two bedrooms. During the daytime or early evening these rooms are not used; therefore the cooling equipment is idle.

Now consider this same home air conditioned according to plan 2. Assume, for example, a centrally located closet available for locating a 1 hp water-cooled unit. By means of a minimum of ductwork furred into the hall ceiling and a diverting damper, it is possible to direct all the air into the three bedrooms, or into the living-dining area, or to allow some air to enter all areas. This permits much more effective use of the same installed capacity. Plan 2 can be used quite well in small, low-cost homes that do not have central forced warm air heating systems. It can also be used to advantage in apartments.

## Complete Conditioning

Plan 3 involves a central-station cooling plant usually installed in connection with a forced-air heating system. Ductwork and blower are common to both the heating and the cooling units. The cooling unit for this plan is selected to condition the entire house, but it is sized no larger

than is absolutely necessary to produce a degree of comfort on peak-load days. The successful performance of a unit under this plan is based upon practically continuous operation under peak or near peak load conditions. Some dry bulb temperature slip is expected on certain days, but it is realized that this will not affect comfort appreciably, since continuous unit operation will keep the relative humidity at a comfortable level. If the possibility of some dry bulb slip is accepted, and the heating plant blower and duct system are used, plan 3 offers complete home conditioning at a very minimum first and operating cost. Cooling units for this plan with both air and water-cooled condensers are being offered by an increasing number of manufacturers.

Plan 4 calls for a completely engineered cooling system — from the cooling unit to the distribution grilles. The duct system is designed primarily for cooling and may be completely independent of the heating system. The unit is selected to maintain a guaranteed temperature and maximum relative humidity. Reheat coils are used. Modern controls provide hairline constancy of temperature and humidity. Positive control of fresh air is provided. In short, nothing is omitted that is known to help provide the ultimate in year 'round air conditioning.

Residential air conditioning on a large scale is fairly new. Very few home owners or even builders are fully acquainted with its various aspects. The dealer has a definite responsibility to inform himself and the public in his territory about how it is accomplished, what the problems are, and what the costs of the various methods are. Satisfied customers will not result from over-selling. Expected performance and operating costs must be estimated honestly.

## Variety of Equipment Available

Having helped the home owner decide what plan of air conditioning he should have or can afford, the dealer is then ready to examine available equipment and determine how he best can fulfill the require-

ments of the customer. To do this intelligently, he must be familiar with the functioning of the various basic types of air conditioning equipment.

Among the choices which the dealer may have to make are:

1. Factory-built, completely self-contained unit vs. field-assembled components consisting of a condensing unit, cooling coil, and necessary interconnecting lines.
2. Belt-driven unit vs. semi-hermetic or true hermetic unit.
3. Expansion valve vs. restrictor tube liquid control.
4. Air-cooled vs. water-cooled condenser.
5. Cooling tower vs. city or well water.
6. "Freon-12" refrigerant vs. "Freon-22."
7. Heating and cooling units in same package vs. separate heating and cooling units.

Many of these units and other components (such as filters) have been dealt with in some detail in earlier articles of this series. Our purpose here is to review some equipment briefly, setting down the most important considerations in each case.

## Assembled or Factory-Built?

First of all, let us compare the completely self-contained, factory-built unit with the unit put together of field assembled components. The factory-built unit has a number of advantages. Being assembled in a factory under ideal conditions by men who know how, it should have a cost advantage. Field labor to mount, pipe, evacuate, and charge with refrigerant is costly, because it requires a high degree of skill, because it takes time to cut and try, and because all work must be done by hand with portable equipment and tools.

Factory-built units are pre-tested under the most extreme conditions of operation. Because of this and also because of controlled cleanliness and dehydration during manufacture, factory-built units can be guaranteed against defective parts and workmanship for periods up to five years. There is very little chance of leaks, insufficient motor capacity, failure at extreme conditions and unwarranted noise. The performance of the combination of components in a factory-built unit is a known factor and does not have to be determined



on the job after installation.

On the plus side for the field assembled system is its convenience in arrangement. Whereas the factory-assembled unit is usually built into a cabinet which must be located to suit the factory designer's ideas of application, the field-assembled components can be arranged to suit the job to which they are applied. Also, components of the field-assembled unit can be selected to match exactly any cooling requirement where a definite sensible to latent (moisture removal) relationship is specified.

### **Belt-Driven or Hermetic?**

Next let us compare the belt-driven unit with the semi-hermetic and true hermetic unit. One of the major factors in the success of the domestic refrigerator was the development of the hermetically sealed compressor. A big source of leaks in early belt-driven machines was the shaft seal, the means whereby refrigerant was kept from leaking out of the system at the point where the compressor crankshaft emerges. Present day belt-driven machines are still vulnerable in this respect. In order to conserve refrigerant during prolonged periods of inoperation when the seal is not bathed in oil, they must be "pumped down". This procedure, requiring a service man, places the refrigerant in the condenser where it is valved off to keep it from escaping.

In addition to the possibility of a leaking shaft seal, the belt-driven compressor has the disadvantage of the belt itself. Belts must of course be replaced at intervals.

On the plus side for the belt-driven compressor is its relatively slow speed (as compared with a direct-driven hermetic compressor) which tends to long life. Most compressors of this type can easily be repaired by the average service man. With the belt drive, compressor speeds can be changed to meet special application problems.

Eliminating some of the disadvantages of the belt-driven compressor with its shaft seal is the semi-hermetic, or as frequently termed, the "service-sealed" compressor. This device contains a motor and direct-

driven compressor in one casing. Compressor heads and crankcase ports are removable for servicing. One disadvantage of this type of unit is that it can be opened by anyone, and, therefore, there is no factory controllable means for assuring the customer proper servicing.

The ultimate in sealed refrigerant circuits is the one containing the true hermetic compressor-motor unit. This unit contains a motor and compressor welded inside a casing which has no service ports. The motor-compressor unit is part of a refrigerant system which has all joints in the piping soldered. No part of the system can be opened without the use of a torch. The compressor itself cannot be serviced except by returning it to the factory or other authorized service station.

### **Valve or Capillary Tube?**

A third choice to be made is between a unit having a thermal expansion valve and one having a restrictor or capillary tube to throttle liquid refrigerant from the condensing pressure to the evaporating pressure. On the plus side for the expansion valve is the fact that it is self adjusting for varying load conditions. In other words, no matter whether an air conditioner is supplied with entering air at 90 F or at 70 F, the thermal expansion valve will adjust itself to give maximum cooling coil performance. The case against the expansion valve is that it contains moving parts which are subject to wear and eventual failure.

The success of the restrictor or capillary tube can be seen by its almost 100 per cent adoption by the domestic refrigerator industry. It is simple, foolproof, and contains no moving parts to wear. On the negative side — a restrictor, being a long tube with a very small diameter hole through it, is subject to clogging with dirt or ice if it is used in a system that has not been meticulously cleaned and dehydrated before being charged with refrigerant.

When used on units with water-cooled condensers where the head pressure (condensing pressure) is

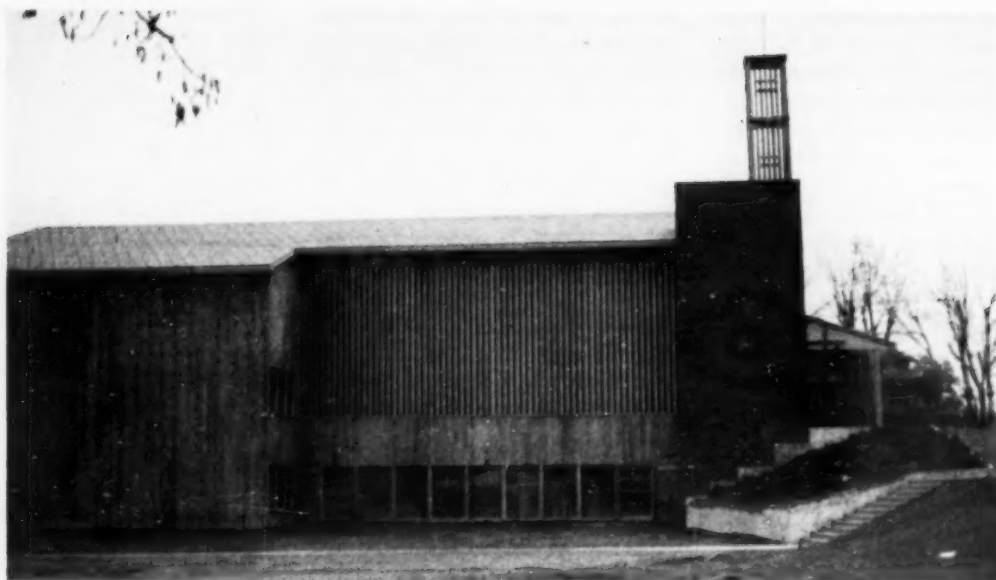
held fairly constant by a water regulating valve, the restrictor will perform most efficiently only at the operating condition (coil entering air temperature and quantity) for which it was selected. High coil superheat temperatures indicating less efficient use of the cooling surface can be expected for higher than design entering air temperatures. Very low coil superheat temperatures, indicating an approach to liquid slopover to the compressor, can be expected when entering air temperatures are very far below design conditions.

When used on units with air-cooled condensers where the head pressure of the refrigerant system will vary with the outside air temperature as also will the cooling load, the restrictor-controlled unit has an interesting advantage. Refrigerant flow through the tube depends upon the difference between the condensing and evaporating pressures. On hot days when maximum cooling is needed, the air-cooled condenser will operate at a high condensing pressure and force a maximum amount of liquid through the tube, resulting in a high evaporator pressure (and temperature) and a relatively high ratio of sensible to latent cooling. On cooler (and often muggy) days the air-cooled condenser will operate at a lower head pressure. Less refrigerant will be forced through the restrictor. The cooling coil will operate at a high superheat and at a relatively lower pressure and temperature. The lower temperature increases the relative amount of latent cooling (moisture removal) compared with sensible cooling, which is exactly what is needed for a cool but muggy day.

### **Air-Cooled or Water-Cooled?**

The fourth choice indicated above is between a unit with an air-cooled condenser and one with a water-cooled condenser. The choice here may be dictated by the cost or availability of water and sewage facilities. All things being equal, however, it should be remembered that the water cooled unit will generally produce more cooling per kilowatt of com-

*(Please turn to page 111)*



## For New Church...



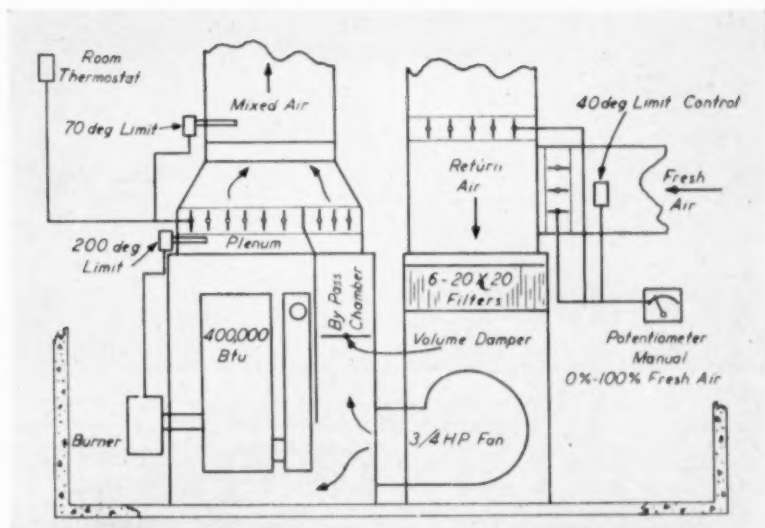
TO HEAT the church, two 400,000 Btu furnaces (*left*) are used, which provide four-zone control (*see arrow*); outlets in the concrete basement floor (*center*) distribute air at the perimeter; and similar outlets are used in the main auditorium (*right*), where the large grilles are for return air.

## A Four-Zone Warm Air System

THE HEATING SYSTEM for the new Central Lutheran Church in Yakima, Wash., utilizes two warm air furnaces, and a four-zone perimeter heating system. The Buren Sheet Metal Co. of Yakima designed and installed the system in this modern two-story building.

Two warm air furnaces, with 400,000 Btu capacity each, are used for the church installation. The furnaces operate with low pressure oil burners, and each has a bypass chamber for independent control of continuous air circulation.

**The perimeter ductwork is convertible without alteration to summer cooling**



FOR THE SUMMER cooling cycle, face and bypass dampers are controlled by the differential between room and plenum thermostats; on the winter cycle they are controlled by the entering air temperature

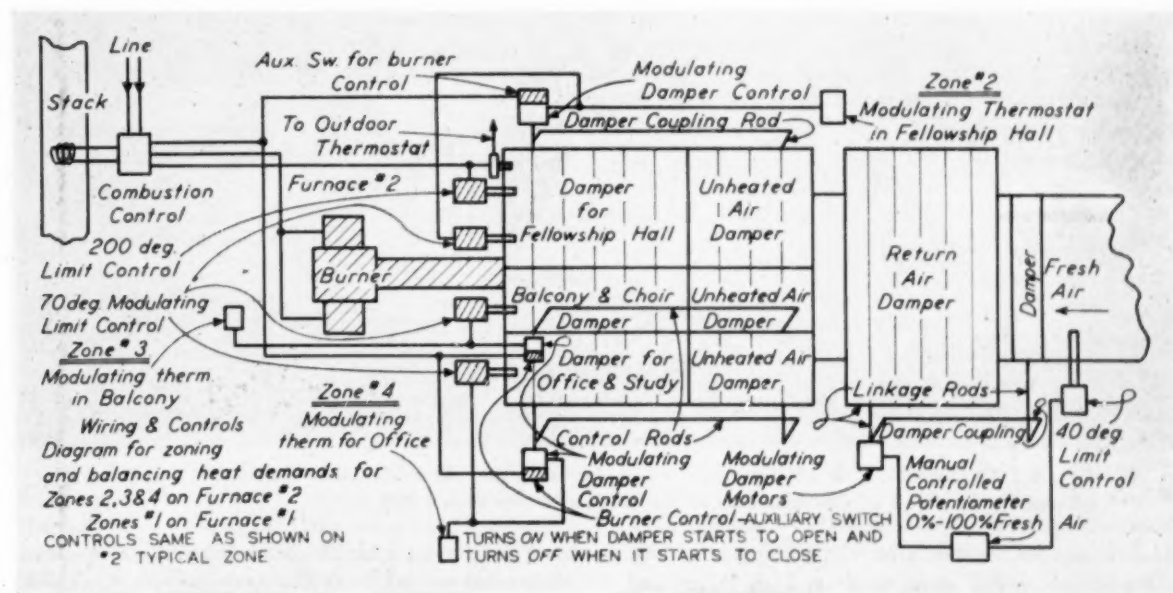
The building has four zones, each of which has automatic motorized damper control from a zone thermostat. A fresh air intake is operated in the same zoning manner, effecting a balance in duct temperature as required by each zone. Thus, ventilation alone could be provided for the balcony and choir loft while heat was supplied to the main auditorium.

Each zone has a low limit night holding thermostat supplemented by a thermostat for providing heat when required. The fuel system incorporates a 4000 gal

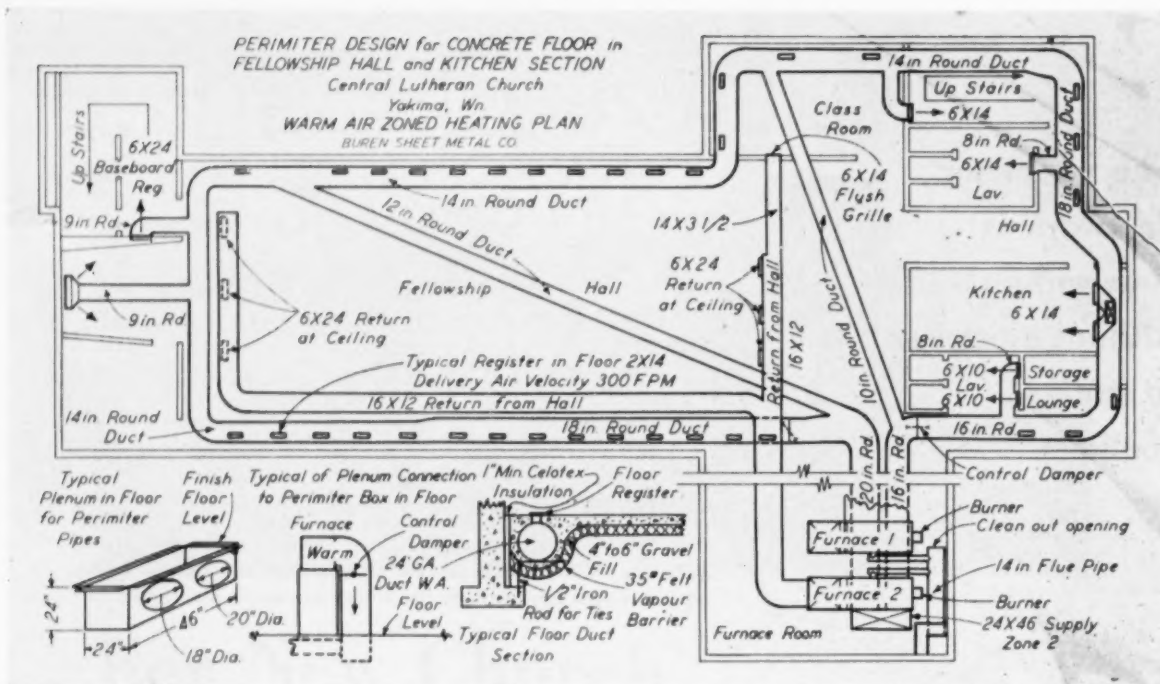
tank. An electrical control system, illustrated in the accompanying control system diagram, provides comfort in any part of the building at any time.

**Heating the Basement and Auditorium**

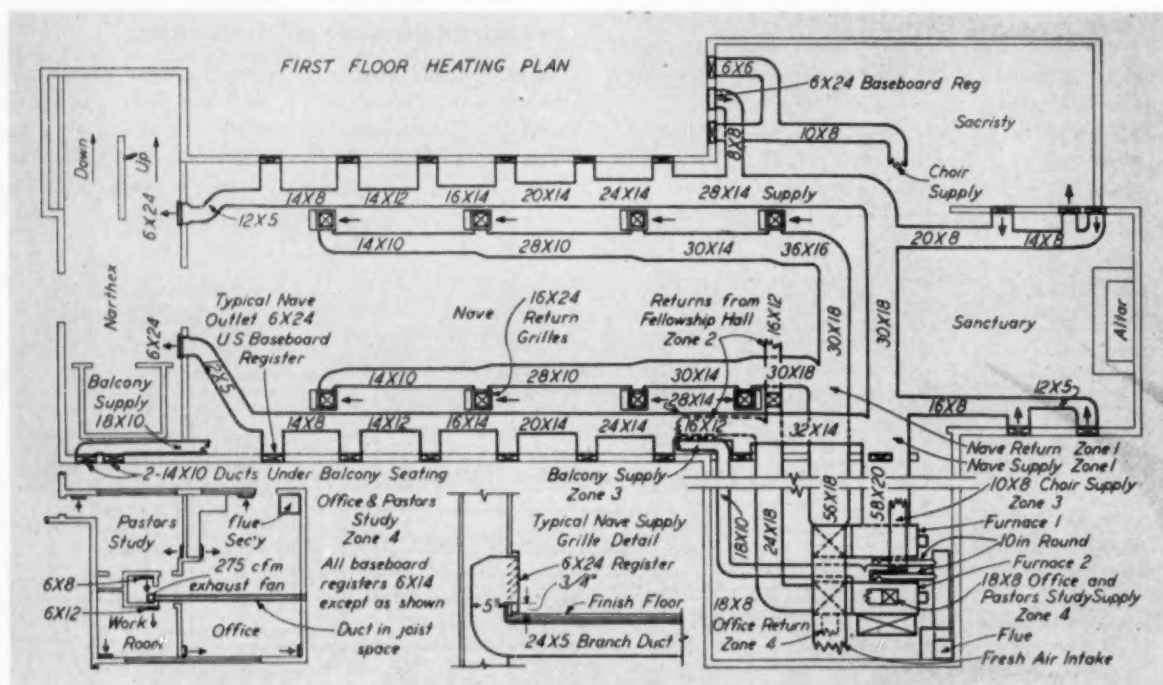
The concrete floor area in the basement hall is approximately 5500 sq ft. A perimeter system of ductwork was buried in the concrete slab. The outside walls were insulated from the slab with 1 in. rigid insulation, in such a manner as to permit the slab temperature to be



THE ELECTRICAL SYSTEM for each furnace sets a pattern of temperature control by controlling the modulating dampers in the plenum chamber and in the return air system



DUCT LAYOUT of the perimeter heating system for the basement. All supply ducts were located in the floor, the return ducts in the ceiling. Details are given for construction of floor plenum chambers



LAYOUT OF THREE-ZONE air distribution system for main floor and balcony follows perimeter system requirements. Return air is taken from floor level at the foot of each interior arch

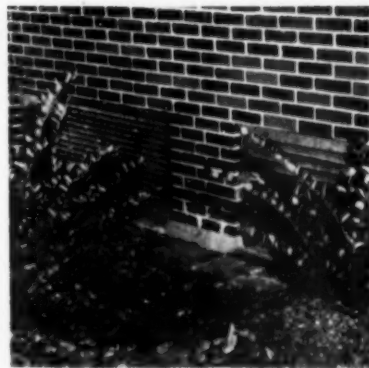
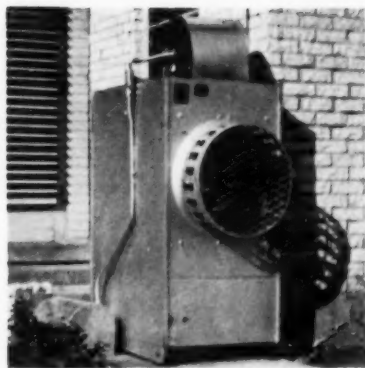
equal throughout the floor area.

The return system takes air from both ceiling and floor outlets to assure good air distribution. The perimeter outlets are 21 $\frac{1}{4}$  x 14 in. floor registers placed

on 7 ft centers around the perimeter, and a temperature differential ranging from 2 to 4 deg from floor to ceiling throughout the hall is achieved.

(Please turn to page 111)





# RESIDENTIAL COOLING

## Equipment Available This Year

(COOLING TOWERS AND EVAPORATIVE CONDENSERS)

THE TYPE OF EQUIPMENT used to provide summer cooling for a residence depends — among other things — upon the location of the house. Considerations that enter into the selection of the right equipment include the geographical location, climatic conditions and the availability of economical utilities.

The geographic location affects the cooling capacity required — that is, a residence located in Michigan would not require as large a cooling system as the same residence if it were in New Orleans.

Climatic conditions determine whether evaporative cooling can provide comfort, or if mechanical cooling equipment is required. A home in Tucson may be able to obtain satisfactory and economical cooling with a central evaporative cooler system because the moisture content of the air is much lower than it is in Shreveport, with its high temperatures and high relative humidities.

### How Utilities Affect Choice of Equipment

The availability of economical utilities applies both to the electric power and the condensing medium. If electrical power is relatively cheap, then a heat pump system may be decided upon — whereas the same residence in another area might install instead a cooling package in combination with a fuel burning system.

The condensing medium is perhaps the most flexible of all the factors that must be taken into consideration. If an air cooled condenser is to be used, it can be located adjacent to the other conditioning equipment with ductwork to provide an adequate supply and exhaust of outside air; or if desired, the air cooled condenser along with its blower can be installed in a convenient place outside of the building and the refrigerant lines extended to complete the heat removing cycle.

If water is to be used, its availability, disposal, and

cost must be considered. Frequently, the supply or disposal of water is restricted or its cost is more than is desirable from an economical operating point of view; this is where the water cooling tower or evaporative condenser frequently can provide a suitable answer.

Cooling towers and evaporative condensers can save up to 97 per cent of the water by utilizing the latent heat properties of water — See *Using Cooling Towers and Evaporative Condensers*, American Artisan, June 1953, for complete details.

Cooling towers for residential applications have received considerable attention in the last few years, and steps have been taken to harmonize this equipment with existing landscaping. Some towers have been placed alongside the garage and a protecting trellis built around the exposed views; frequently this trellis is covered with growing plants. Some towers have been put on top of garages, giving the effect of a small house with a chimney; another location for a cooling tower is in a ventilated attic where the air, after it passes through the tower, is discharged through louvers to the outside.

### Other Artisan Surveys

In the March, April, May and June issues of *American Artisan*, central mechanical cooling equipment ranging from 1½ to 10 hp for residential application has been reviewed as data became available. Also, in the May issue, evaporative cooler specifications were given, and in June, heat pumps were reported on. The data has been furnished for publication by the respective manufacturers at the request of *American Artisan*.

[Illustrated above are some of the arrangements used when water conserving devices are installed for residential applications. Photographs are courtesy of Marley Co. (left), Acme Equipment Co. (center), and Kramer-Trenton Co. (right).]

# Central Cooling Equipment . . . . . for Warm Air Systems

## Acme

### Cooling Towers

**Capacity:** 2 to 10 tons at entering condensing water temperature of 95 F, cooled to 87.5 F, and maximum outside air wet bulb temperature of 80 F at 4 gpm per ton; other models available operate with entering condensing water temperature of 97 F, cooled to 87 F with a maximum outside air wet bulb temperature of 80 F at 3 gpm per ton.

**Sizes available:** 2, 3, 5, 7½, and 10 tons.

**Method of cooling water:** Water spray with counter-airflow.

**Cabinet:** Galvanized steel, interior coated with rubber base undercoating and exterior coated with aluminum paint.

**Water distribution:** Spray type, one spray header.

**Make-up water control:** Float valve.

**Blower:** Centrifugal type, induced draft; horizontal discharge standard, vertical available; motor mounted outside of tower is belted to blower.

**Electrical power specifications:** 115 or 230 volt, single phase, and 208 to 220 volt or 440 volt, 3 phase.

**Eliminators:** Fiber glass.

**Maintenance:** Air intake guard removable for cleaning.

**Recommendations for installing:** Suitable for both outside and inside locations.

**Special features:** Variable pitch pulley to balance duct pressure; blower is made of galvanized steel; bearings mounted outside tower.

**Manufacturer:** Acme Equipment Co., 213 E. Broadway, Muskogee, Okla.

## Beck

### Cooling Towers

**Capacity:** 3 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

**Sizes available:** 3, 5, 7½, and 10 tons.

**Draft:** Forced, 375 cfm per ton.

**Cabinet:** Galvanized steel, pitch covered basin.

**Decking:** Cypress.

**Water distribution system:** Spray type, one spray header.

**Sump:** Open.

**Make-up water control:** Float.

**Blower:** Propeller type, induced draft, vertical discharge; Z eliminators provided as protection against spray for motor; direct connection to motor.

**Electrical power specifications:** 115 or 230 volt, single phase, or 220 or 440 volt, 3 phase.

**Eliminators:** Cypress.

**Maintenance:** Removable top section for fan and nozzles.

**Recommendations for installing:** May be installed outdoors or inside; maximum duct resistance 0.150 in. WG.

**Special features:** Cylindrical shape and corrugated sides for strength and low wind resistance.

**Note:** Units not available for national distribution until 1954.

**Manufacturer:** Beck Mfg. Co., Inc., 315 W. Main St., New Albany, Ind.

## Bush

### Cooling Towers

**Capacity:** 3 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

**Sizes available:** 3, 5, 7½ and 10 tons.

**Draft:** Forced air. 3 ton, 800 cfm; 5 ton, 1150 cfm; 7½ ton, 1725 cfm; 10 ton, 2660 cfm.

**Cabinet:** Galvannealed steel, rubber base undercoating.

**Decking:** Galvannealed steel, fastened with cadmium plated bolts.

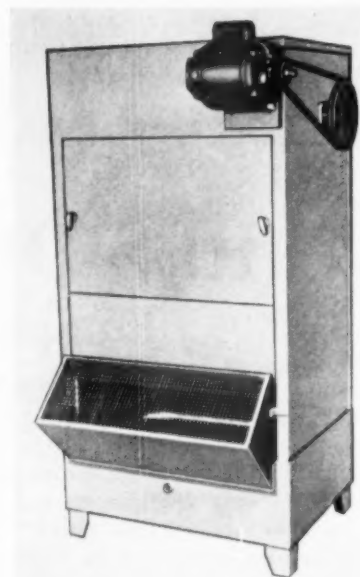
**Water distribution:** Spray type, with one spray header; 3 ton unit has two nozzles; 5 ton unit, four nozzles; 7½ ton unit, six nozzles; and 10 ton unit, eight nozzles.

**Eliminators:** Galvannealed steel.

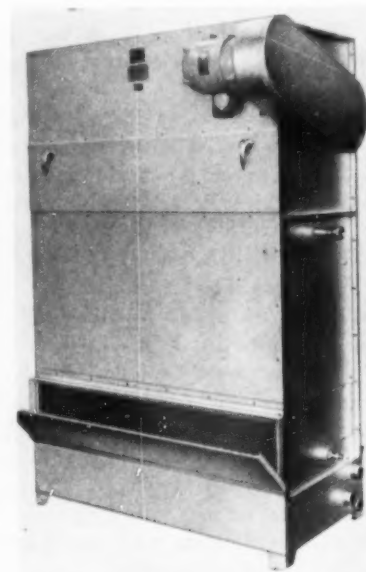
**Sump:** Closed.

**Make-up water control:** Float valve.

**Blower:** Centrifugal type, induced draft, vertical discharge; motor located outside and belted to blower.



Acme Equipment Co.'s cooling tower

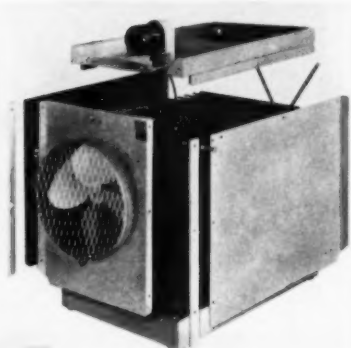


Bush Mfg. Co.'s cooling tower

## Central Cooling Equipment . . . . . for Warm Air Systems



Halstead & Mitchell's cooling tower



Havens Structural Steel Co.'s cooling tower



Kennard Corp.'s cooling tower

*Electrical power specifications:* 110 volt, single phase; 220 volt, 3 phase.

*Maintenance:* Access door to blower section; access panel to wetted surface.

*Recommendations for installing:* Suitable for both inside and outside locations.

*Special features:* Equipped with variable sheave to adjust fan rpm; outside mounted grease fittings.

### Evaporative Condensers

*Capacity:* 5 to 10 tons at entering condensing water temperature of 105 F and maximum outside air wet bulb temperature of 78 F.

*Sizes available:* 5, 7½ and 10 tons.

*Draft:* Forced air; 5 ton, 2000 cfm; 7½ ton, 2400 cfm; 10 ton, 3200 cfm.

*Cabinet:* Galvannealed steel, rubber base undercoating.

*Decking:* Galvannealed steel, fastened with cadmium plated bolts.

*Water distribution:* Gravity, from pan.

*Sump:* Closed.

*Make-up water control:* Float valve.

*Blower:* Centrifugal type, induced draft, vertical discharge; motor mounted outside and belted to blower.

*Electrical power specifications:* 110 volt, single phase.

*Eliminators:* Galvannealed steel.

*Cooling coil:* Copper.

*Maintenance:* Access panels to blower section and wetted surface for cleaning.

*Recommendations for installing:* Suitable for inside or outside locations.

*Special features:* Built in sections which can be moved through standard width doors.

*Manufacturer:* Bush Mfg. Co., 179 South St., West Hartford 10, Conn.

### Halstead & Mitchell

#### Cooling Towers

*Capacity:* 2 to 10 tons at entering condensing water temperature of 95

F and maximum air wet bulb temperature of 80 F.

*Sizes available:* 2, 3, 5, 7½ and 10 tons.

*Draft:* Induced at 300 cfm per ton.

*Cabinet:* Steel, painted with vinyl zinc and chlorinated rubber.

*Decking:* Pressure treated wood, fastened with rustproof screws.

*Water distribution:* Gravity, from distribution pan located at top of unit.

*Sump:* Closed.

*Make-up water control:* Float.

*Blower:* Stainless steel, propeller type; induced draft; horizontal discharge; direct connection to motor on 2 and 3 ton units, on 5 to 10 ton models motor is belted to blower.

*Eliminators:* Wood.

*Maintenance:* Can be disassembled for maintenance; distribution pan and decking removable.

*Recommendations for installing:* Designed for outside location.

*Special features:* Stainless steel fan; pressure treated decking, to protect against fungi and bacterial growth.

*Manufacturer:* Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.

### Havens

#### Cooling Towers

*Capacity:* 2 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

*Sizes available:* 2, 3, 5, 7½ and 10 tons.

*Draft:* Induced air.

*Cabinet:* Steel.

*Decking:* Redwood.

*Water distribution:* Gravity, from a top distribution pan.

*Sump:* Closed reservoir.

*Make-up water control:* Float valve.

*Blower:* Propeller type, induced draft, horizontal discharge, stainless steel fan shaft; motor belted to blower except on 2 and 3 ton models which have direct connection.

*Electrical power specifications:* 115, 220 or 440 volt, single or 3 phase.

## Central Cooling Equipment . . . . . for Warm Air Systems

*Eliminators:* Redwood.

*Recommendations for installing:* Suitable for inside or outdoors. Will handle short amount of duct-work.

*Special features:* Larger size towers — 7½ tons and up — are easily disassembled for moving through narrow doors and other openings. Available in hot dipped galvanized after fabrication.

*Manufacturer:* Havens Structural Steel Co., Cooling Tower Div., 1713 Crystal Ave., Kansas City 26, Mo.

### **Kennard**

#### **Cooling Towers**

*Capacity:* 3 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

*Sizes available:* 3, 5, 8 and 10 tons.

*Draft:* Induced.

*Cabinet:* Galvanized steel.

*Decking:* Redwood.

*Water distribution:* Spray type, with brass nozzles; one spray header.

*Sump:* Closed.

*Make-up water control:* Float valve.

*Blower:* Centrifugal type, induced draft, vertical discharge; motor belted to blower.

*Eliminators:* Galvanized steel.

#### **Evaporative Condensers**

*Capacity:* 3 to 10 tons at entering condensing water temperature of 105 F and maximum outside air wet bulb temperature of 78 F.

*Sizes available:* 3, 5, 7½ and 10 tons.

*Draft:* Induced.

*Cabinet:* Galvanized steel, outside painted with aluminum paint and interior spray coated with asphalt and asbestos fiber material.

*Water distribution:* Spray type, with brass nozzles; one spray header.

*Sump:* Closed.

*Make-up water control:* Float valve.

*Blower:* Centrifugal type, induced draft, vertical discharge; motor belted to blower.

*Cooling coil:* Copper.

*Special features:* Drain connection is arranged for piping in any direction; separate overflow and drain connections.

*Manufacturer:* Kennard Corp., 1819 S. Hanley Rd., St. Louis 17, Mo.

### **Kramer Trenton**

#### **Cooling Towers**

*Capacity:* 2-1/3 to 10 tons at entering condensing water temperature of 90 F and maximum outside air wet bulb temperature of 80 F.

*Draft:* Forced air.

*Cabinet:* Steel, hot galvanized.

*Decking:* Steel, fastened with plated brass bolts.

*Water distribution:* Drip pan type, no nozzles, one spray header.

*Sump:* Closed.

*Make-up water control:* Float valve.

*Blower:* Propeller type, forced draft, horizontal discharge; motor protected against spray with bell type shield; direct connected to motor.

*Electrical power specifications:* 220 volt, single phase.

*Maintenance:* Removable screen provides complete accessibility.

*Recommendations for installing:* Suited for use with hermetic air conditioning system or with water cooled condensers.

*Special features:* Fireproof fill; unit shipped assembled; motor hood for outside mounting furnished.

#### **Evaporative Condensers**

*Capacity:* 2.16 to 10 tons at entering condensing water temperature of 105 F and maximum outside air wet bulb temperature of 75 F.

*Draft:* Forced air.

*Cabinet:* Stainless steel or hot galvanized steel.

*Water distribution:* Special spray type, no nozzle, one spray header.

*Sump:* Open.

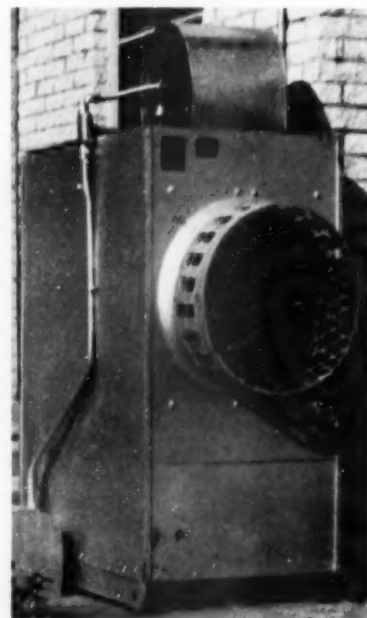
*Make-up water control:* Float valve.

*Blower:* Propeller type, forced air, horizontal discharge; direct connected to motor.

*Cooling coil:* Copper.



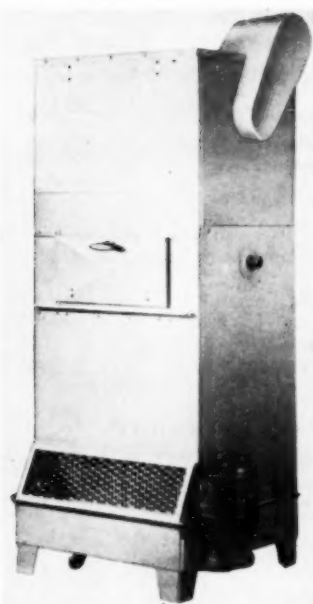
Kennard Corp.'s evaporative condenser



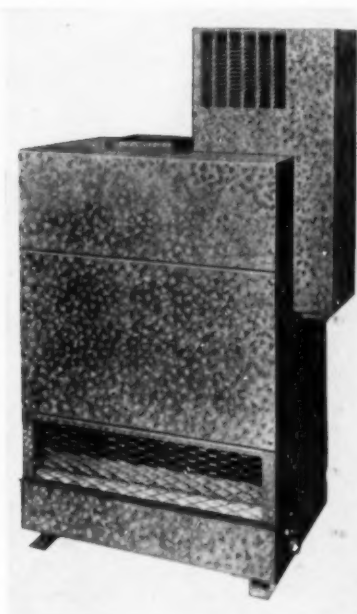
The Marley Co.'s cooling tower



## Central Cooling Equipment . . . . . for Warm Air Systems



Marlo Coil Co.'s Cooling Tower



McQuay Inc.'s cooling tower

**Eliminators:** Stainless or galvanized steel.

**Maintenance:** Eliminator may be removed for complete accessibility; pump and sump are removable.

**Recommendations for installing:** Can be installed indoors or outdoors on any refrigeration system which allows for an evaporative condenser.

**Special features:** Stainless steel or hot galvanized housing; easy mounting.

**Manufacturer:** Kramer Trenton Co., N. Olden & Breunig Ave., Trenton 5, N. J.

### **Marley** Cooling Towers

**Capacity:** 2 to 10 tons at entering condensing water temperature of 95 F and design outside air wet bulb temperature of 78 F.

**Sizes available:** 2, 3, 5, 7½ and 10 tons.

**Draft:** Induced at 350 to 700 cfm per ton.

**Cabinet:** Steel, lined with rubber compound. Also an all-redwood non-corrosive model.

**Decking:** Redwood.

**Water distribution:** Gravity, from a top basin.

**Eliminators:** Redwood.

**Sump:** Open.

**Make-up water control:** Automatic float valve.

**Blower:** Propeller type, horizontal discharge; motor located outside of air stream is belted to blower. On redwood model, forced draft, vertical discharge.

**Electrical power specifications:** 110 or 220 volt, single or 3 phase.

**Maintenance:** Doors and panels are removable for cleaning.

**Manufacturer:** The Marley Co., 222 W. Gregory Blvd., Kansas City 13, Mo.

### **Marlo** Cooling Towers

**Capacity:** 2 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

**Sizes available:** 2, 3, 5, 8, 10 tons.

**Draft:** Forced, 300 cfm per ton.

**Cabinet:** Galvanized steel.

**Water distribution:** Spray type.

**Eliminators:** Galvanized steel.

**Make-up water control:** Automatic.

**Blower:** Centrifugal type, forced air, vertical discharge; motor belted to blower.

**Electrical power specifications:** 110 or 220 volt.

**Maintenance:** Fitted with inspection doors to facilitate servicing.

**Manufacturer:** Marlo Coil Co., 6135 Manchester Ave., St. Louis 10, Mo.

### **McQuay** Cooling Towers

**Capacity:** 3 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

**Sizes available:** 3, 5, 7½, 10 tons.

**Draft:** Forced, 300 cfm per ton.

**Cabinet:** Steel, galvanized.

**Decking:** Expanded copper.

**Water distribution system:** Spray type, six to 20 nozzles, one spray header.

**Sump:** Open.

**Make-up water control:** Float valve.

**Blower:** Centrifugal type, induced draft, vertical discharge; motor located outside, belted to blower.

**Eliminators:** Expanded copper.

**Maintenance:** Front panels may be removed for cleaning.

### **Evaporative Condensers**

**Capacity:** 3½ to 10 tons at entering condensing water temperature of 105 F and maximum outside air wet bulb temperature of 75 F.

**Sizes available:** 3½, 6 and 10 tons.

**Draft:** Forced, 225 cfm per ton.

**Cabinet:** Steel, galvanized.

**Water distribution:** Gravity, pan type.

**Sump:** Open.

**Make-up water control:** Float valve.

**Pump motor:** 115 or 230 volts, single phase.

**Blower:** Centrifugal type, induced

## Central Cooling Equipment . . . . . for Warm Air Systems

draft, vertical or horizontal discharge; external motor, belted to blower.

*Cooling coil:* Bare copper.

*Maintenance:* Front panels removable for cleaning.

*Recommendations for installing:* Both cooling towers and evaporative condensers may be installed indoors or outdoors. For outdoor service, a motor weather hood and fan outlet cowl are available.

*Manufacturer:* McQuay, Inc., 1600 Broadway, N.E., Minneapolis 13, Minn.

### Nevinger

#### Cooling Towers

*Capacity:* 2 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

*Draft:* Forced air, at 300 cfm per ton.

*Cabinet:* Galvanized steel.

*Decking:* Galvanized steel, fastened with galvanized bolts.

*Water distribution:* Spray type, with one spray header.

*Sump:* Closed.

*Make-up water control:* Float.

*Blower:* Centrifugal type, induced draft, vertical or horizontal discharge; motor belted to blower.

*Electrical power specifications:* 110 or 220 volt, single phase; 220 or 440 volt, 3 phase.

*Eliminators:* Galvanized steel.

*Maintenance:* Access panels.

#### Evaporative Condensers

*Capacity:* 2 to 10 tons at entering condensing water temperature of 95 F and maximum outside air wet bulb temperature of 78 F.

*Draft:* Forced air, at 300 cfm per ton.

*Cabinet:* Galvanized steel.

*Decking:* Galvanized steel, fastened with galvanized bolts.

*Water distribution:* Spray type, with one spray header.

*Sump:* Closed.

*Make-up water control:* Float.

*Blower:* Centrifugal type, induced draft, vertical or horizontal discharge; motor belted to blower.

*Electrical power specifications:* 110 or 220 volt, single phase; 220 or 440 volt, 3 phase.

*Eliminators:* Galvanized steel.

*Cooling coil:* Copper.

*Maintenance:* Panels removable for cleaning.

*Manufacturer:* Nevinger Mfg. Co., Inc., Greenville, Ill.

### Power-Freeze

#### Compressor-Evaporative Condenser Combination

*Capacity:* 2 to 7½ tons, 21,000 to 90,000 Btu per hr, at entering condensing water temperature of 85 F. (All compressor models are 2 cylinder, semi-hermetic, reciprocating type).

*Sizes available:* 2, 3, 5 and 7½ tons.

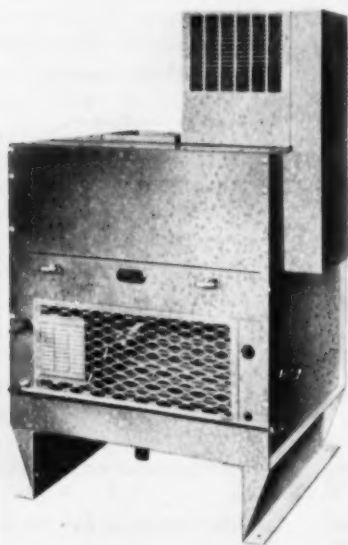
*Cabinet:* Compressor; steel. Evaporative condenser; steel with baked enamel coating.

*Electrical power specifications:* Compressor; 220 volt, single or 3 phase, 7½ ton unit, 220 volt, 3 phase. Evaporative condenser; 230 volt, single phase.

*Draft:* Forced air, 400 cfm per ton.

*Decking:* Heavy steel, fastened with galvanized or brass bolts.

*Water distribution:* Spray type,



McQuay, Inc.'s evaporative condenser



Power-Freeze, Inc.'s Unit

# Central Cooling Equipment . . . . . for Warm Air Systems

with one spray header per ton.

*Sump:* Closed.

*Make-up water control:* Float.

*Blower:* Propeller type, vertical discharge, direct connected to motor.

*Manufacturer:* Power-Freeze, Inc., 45 Third St., N.E., Atlanta, Ga.

## Refrigeration Appliances

### Cooling Towers

*Capacity:* 5 to 10 tons.

*Sizes available:* 5, 7½, 10 tons.

*Draft:* Forced air, 300 cfm per ton.

*Cabinet:* Steel, hot dipped galvanized.

*Decking:* Steel, hot dipped, fastened with cadmium plated or brass bolts.

*Water distribution:* Spray type.

*Sump:* Open.

*Make-up water control:* Float valve.

*Blower:* Centrifugal type, vertical or horizontal discharge.

*Eliminators:* Steel, hot dipped.

*Maintenance:* Decking removable from three sides of unit.

### Evaporative Condensers

*Capacity:* 5 to 10 tons.

*Sizes available:* 5, 7½ and 10 tons.

*Draft:* Forced air, at 300 cfm per ton.

*Cabinet:* Steel, hot dipped galvanized.

*Water distribution:* Spray type.

*Sump:* Open.

*Make-up water control:* Float valve.

*Blower:* Centrifugal type, horizontal or vertical discharge.

*Cooling coil:* Copper and steel.

*Eliminators:* Steel, hot dipped.

*Maintenance:* Staggered tubes of condenser arranged to permit easy cleaning from three directions; condenser may be removed from connection end or either side of unit housing.

*Manufacturer:* Refrigeration Appliances, Inc., 901-923 W. Lake St., Chicago 7, Ill.

### Servel

#### Evaporative Water Coolers

*Capacity:* 3 to 5 tons, rated at maximum outside air wet bulb temperature of 78 F.

*Sizes available:* 3 and 5 tons.

*Draft:* Forced air. 3 ton, 1100 cfm; 5 ton, 2100 cfm.

*Cabinet:* Asbestos cement board.

*Decking:* Asbestos cement board, fastened with brass or galvanized bolts.

*Water distribution:* Spray type, with one spray header; 3 ton unit

has 10 nozzles, 5 ton unit, 18.

*Make-up water control:* Automatic float valve.

*Blower:* Centrifugal type, forced draft, horizontal discharge; motor belted to blower.

*Electrical power specifications:* Dual voltage, single phase.

*Eliminators:* Galvanized steel.

*Maintenance:* Front and rear panels removable; sump screen removable.

*Recommendations for installing:* May be installed indoors or outdoors.

*Special features:* Water inlet piping may be connected at either end of spray header; motor-pump unit may be attached to either end of receiving basin or in remote place.

*Manufacturer:* Servel, Inc., Air Conditioning Div., Evansville 20, Ind.

### York

#### Evaporative Condensers

*Capacity:* 2 to 10 tons at entering condensing water temperature of 95 F and maximum outside wet bulb temperature of 78 F.

*Sizes available:* 2, 4, 6, 10 tons.

*Cfm:* 2 ton, 770; 4 ton, 1030; 6 ton, 1600; 10 ton, 3200.

*Cabinet:* Galvanized steel.

*Water distribution:* Gravity, through perforated plate.

*Sump:* Galvanized sump pump.

*Make-up water control:* Float valve.

*Blower:* Propeller type, vertical discharge; direct connection to motor; 115 or 230 volt, single phase motor.

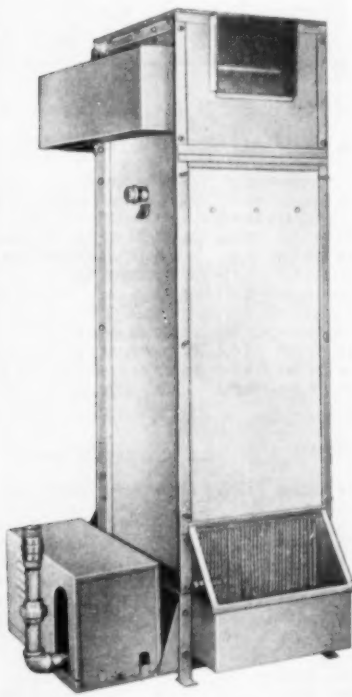
*Cooling coil:* Copper or steel.

*Maintenance:* Panels are removable for cleaning.

*Recommendations for installing:* Can be installed either outside or inside; provision for air venting to outside must be made on indoor applications.

*Special features:* Suitable for indoor or outdoor applications; internal receivers provided; available with split coils for two circuits.

*Manufacturer:* York Corp., York, Pa.



Servel, Inc.'s evaporative water cooler



York Corp.'s evaporative condenser

# Housing Census Heating Data

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the April 1953 American Artisan. Areas covered in that report were Bridgeport, Conn.;

Greensboro-High Point, N.C.; Evansville, Ind.; and Fort Wayne, Ind. In May, areas covered were Rockford, Ill.; Fall River, Mass.; Reading, Pa.; and Seattle, Wash. Similar figures for other areas will appear regularly.

Types of Fuel Used in Centrally Heated Dwelling Units

	Standard Metropolitan Areas											
	Los Angeles, Calif.			Savannah, Ga.	Worcester, Mass.	Minneapolis — St. Paul, Minn.				Syracuse, N.Y.	Dallas, Tex.	
	The area	Los Angeles County	Orange County	Chatham County	Worcester County*	The area	Anoka County	Dakota County	Hennepin County	Ramsey County	Onondaga County	Dallas County
All Dwelling Units	1,521,849	1,442,691	79,158	46,928	76,586	537,792	10,550	13,391	208,122	105,729	101,296	197,203
Number reporting heating equipment	1,424,770	1,356,570	68,200	42,500	74,060	324,550	9,250	12,965	199,645	102,690	95,915	181,795
Central heating	640,180	616,685	23,495	3,905	45,715	262,325	4,380	8,520	163,920	85,505	76,935	33,410
Coal	5,255	5,015	240	425	17,975	99,105	1,735	3,215	51,005	43,150	48,440	405
Wood	2,640	2,470	170	120	365	1,110	155	130	510	315	300	145
Utility gas	610,305	588,630	21,675	1,150	3,625	77,430	740	1,380	70,410	4,900	14,250	31,285
Bottled gas	4,505	3,915	590	255	190	1,305	60	115	910	220	430	995
Liquid fuel	6,660	6,445	215	1,770	21,705	78,655	1,630	3,565	37,870	35,590	12,295	100
Other fuel	8,185	7,655	530	140	1,495	3,150	50	95	2,110	895	890	295
Not reported	2,630	2,555	75	45	360	1,570	10	20	1,105	435	330	185

\*The Standard Metropolitan area of Worcester, Mass., consists of the following parts of Worcester County: Worcester city and Auburn, East Brookfield, Grafton, Holden, Leicester, Millbury, Northborough, North Brookfield, Shrewsbury, Spencer, Westborough and West Boylston.

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

Subject	Total occupied					Owner occupied		Renter occupied						
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit

Standard Metropolitan Area of Los Angeles, Calif.—Los Angeles and Orange Counties

All occupied units	1,404,550	925,880	177,525	111,240	70,540	119,365	755,880	688,790	67,090	648,670	237,090	130,625	97,890	66,610	116,455
<b>HEATING EQUIPMENT</b>															
Central heating	626,408	461,845	58,208	36,010	24,704	45,641	426,763	396,935	29,828	199,645	64,910	36,647	30,809	23,147	44,132
Piped steam or hot water	93,748	45,989	10,812	7,009	4,564	25,374	36,836	32,537	4,299	56,912	13,452	8,175	6,337	4,355	24,593
Warm air furnace	532,660	415,856	47,396	29,001	20,140	20,267	389,927	364,398	25,529	142,733	51,458	28,472	24,472	18,792	19,539
Noncentral heating, with flue	234,385	149,011	28,407	21,506	14,272	21,189	119,606	110,199	9,407	114,779	38,812	22,993	18,841	13,494	20,639
Nonctrl. htng., without flue; or not htd.	521,510	302,210	87,416	51,701	27,378	49,805	199,214	173,477	25,737	322,296	128,733	68,677	46,652	29,068	49,166
Not reported	22,236	12,816	3,488	2,017	1,186	2,729	10,290	8,179	2,111	11,946	4,637	2,308	1,584	901	2,516
<b>YEAR BUILT</b>															
1945 or later	283,703	214,844	24,744	18,944	12,370	12,801	194,593	185,061	9,532	89,110	29,783	18,190	16,903	11,775	12,459
1940 to 1944	168,763	126,081	14,430	13,578	9,474	5,200	110,724	106,080	4,644	58,039	20,001	11,355	12,354	9,215	5,114
1939 or earlier	912,469	565,553	132,806	74,680	45,713	95,717	437,248	386,220	51,028	475,221	177,333	96,612	64,856	42,843	93,577
Not reported	39,621	21,406	5,547	4,040	2,982	5,646	13,323	11,433	1,890	26,298	9,973	4,468	3,778	2,775	5,304

Standard Metropolitan Area of Savannah, Ga.—Chatham County

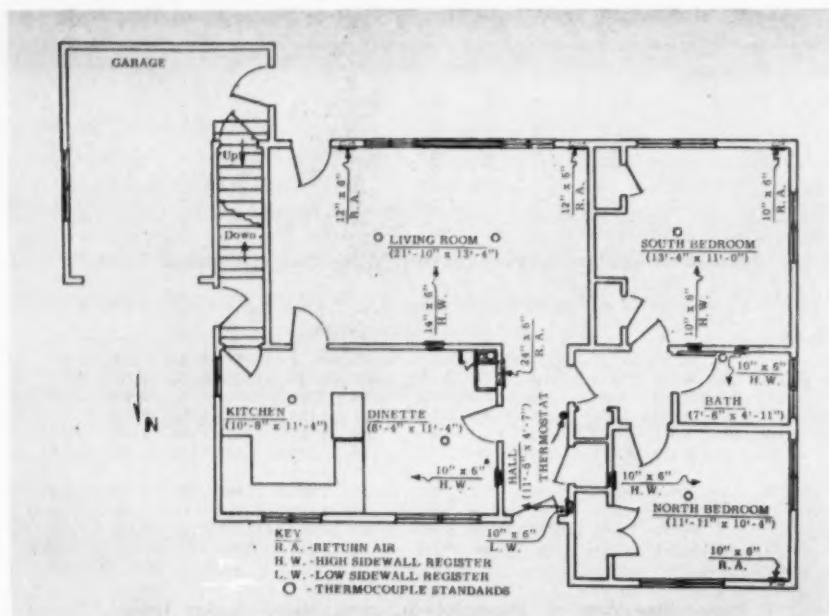
All occupied units	41,520	18,655	13,855	5,135	2,630	1,245	15,430	12,890	2,540	26,090	5,765	11,775	4,790	2,555	1,205
<b>HEATING EQUIPMENT</b>															
Central heating	3,457	2,075	652	259	195	276	2,106	1,916	190	1,351	159	478	259	195	260
Piped steam or hot water	969	439	199	...	195	236	373	348	25	696	91	174	...	195	236
Warm air furnace	2,388	1,636	453	259	...	40	1,733	1,568	165	655	68	304	259	...	24
Noncentral heating, with flue	31,354	13,807	10,967	3,923	1,924	733	11,320	9,341	1,979	20,034	4,466	9,407	3,603	1,840	709
Nonctrl. htng., without flue; or not htd.	5,910	2,351	1,995	888	487	189	1,741	1,394	347	4,169	957	1,673	863	487	189
Not reported	800	422	242	65	24	47	265	240	25	535	182	217	65	24	47
<b>YEAR BUILT</b>															
1945 or later	4,823	4,013	376	408	...	26	3,260	3,181	79	1,563	832	324	381	...	26
1940 to 1944	6,209	2,659	1,858	599	726	367	2,343	2,213	130	3,866	446	1,728	599	726	367
1939 or earlier	29,869	11,726	11,407	4,046	1,904	786	9,571	7,358	2,213	20,298	4,368	9,587	3,728	1,829	786
Not reported	578	257	213	82	...	26	216	138	78	362	119	135	82	...	26



# Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

Subject	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
<b>Standard Metropolitan Area of Worcester, Mass.—Parts of Worcester County*</b>															
All occupied units	72,020	24,885	12,560	25,290	6,640	2,645	32,705	22,130	10,575	39,315	2,755	7,640	19,970	6,375	2,575
<b>HEATING EQUIPMENT</b>															
Central heating	44,197	20,523	7,949	10,533	3,215	1,977	26,271	18,984	7,287	17,926	1,539	4,259	7,192	2,994	1,942
Piped steam or hot water	38,243	16,418	7,034	9,728	3,107	1,956	21,729	15,183	6,546	16,514	1,235	3,808	6,664	2,886	1,921
Warm air furnace	5,954	4,105	915	805	108	21	4,542	3,801	741	1,412	304	451	528	108	21
Noncentral heating, with flue	22,241	3,462	3,642	11,852	2,908	377	5,009	2,493	2,516	17,232	969	2,614	10,426	2,864	359
Nonctrl. htng., without flue; or not htd.	4,776	783	755	2,514	474	250	1,180	593	587	3,596	190	654	2,046	474	232
Not reported	810	118	214	393	43	42	247	61	186	563	57	113	308	43	42
<b>YEAR BUILT</b>															
1945 or later	4,085	3,028	545	27	208	277	2,927	2,818	109	1,158	210	436	27	208	277
1940 to 1944	2,456	2,319	82	...	...	55	2,375	2,293	82	81	26	...	...	...	55
1939 or earlier	64,539	19,238	11,720	24,958	6,380	2,243	26,886	16,771	10,115	37,653	2,467	7,128	19,700	6,115	2,243
Not reported	943	301	214	306	52	70	518	249	269	425	52	77	244	52	...
<b>Standard Metropolitan Area of Minneapolis-St. Paul, Minn.—Anoka, Dakota, Hennepin and Ramsey Counties</b>															
All occupied units	313,755	170,665	62,895	25,740	19,145	35,310	187,650	153,865	33,785	126,105	16,800	36,750	20,825	17,515	34,215
<b>HEATING EQUIPMENT</b>															
Central heating	253,985	142,608	42,763	19,003	16,185	33,426	159,761	132,993	26,768	94,224	9,615	22,317	15,018	14,808	32,466
Piped steam or hot water	133,845	48,735	24,134	14,677	13,950	32,349	60,257	44,368	15,889	73,588	4,367	13,108	11,745	12,883	31,485
Warm air furnace	120,140	93,873	18,629	4,326	2,235	1,077	99,504	88,625	10,879	20,636	5,248	9,209	3,273	1,925	981
Noncentral heating, with flue	48,460	22,619	17,281	5,609	2,333	618	23,009	17,005	6,004	25,451	5,614	12,271	4,886	2,158	522
Nonctrl. htng., without flue; or not htd.	6,709	3,397	2,144	752	188	228	3,277	2,623	654	3,432	774	1,652	628	169	209
Not reported	4,595	2,041	700	374	439	1,041	1,598	1,245	353	2,997	796	507	291	381	1,022
<b>YEAR BUILT</b>															
1945 or later	36,287	30,403	4,732	284	138	728	30,600	28,709	1,891	5,687	1,696	2,951	203	138	699
1940 to 1944	15,435	14,190	896	76	83	190	13,974	13,421	553	1,461	769	372	76	83	161
1939 or earlier	254,986	122,847	56,043	24,791	18,397	32,908	140,503	109,703	30,800	114,483	13,144	32,520	20,011	16,851	31,957
Not reported	7,039	3,224	1,218	587	525	1,485	2,569	2,031	538	4,470	1,193	904	533	441	1,399
<b>Standard Metropolitan Area of Syracuse, N.Y.—Onondaga County</b>															
All occupied units	87,885	42,390	23,065	11,040	6,030	5,360	48,285	36,590	11,695	39,600	5,800	13,965	8,925	5,630	5,280
<b>HEATING EQUIPMENT</b>															
Central heating	70,485	33,858	19,274	7,799	4,697	4,857	40,300	30,086	10,214	30,185	3,772	11,303	5,943	4,358	4,809
Piped steam or hot water	15,126	4,879	2,422	1,563	2,468	3,794	5,438	4,108	1,330	9,688	771	1,510	1,239	2,406	3,762
Warm air furnace	55,359	28,979	16,852	6,236	2,229	1,063	34,862	25,978	8,884	20,497	3,001	9,793	4,704	1,952	1,047
Noncentral heating, with flue	14,117	7,137	2,985	2,718	962	315	6,641	5,575	1,066	7,476	1,562	2,160	2,524	931	299
Nonctrl. htng., without flue; or not htd.	1,967	891	486	320	227	43	739	587	152	1,228	304	356	298	227	43
Not reported	1,515	501	321	204	145	144	603	539	264	712	162	147	161	114	128
<b>YEAR BUILT</b>															
1945 or later	7,653	5,909	430	445	590	279	5,477	5,340	137	2,176	569	293	445	590	279
1940 to 1944	2,274	2,091	55	25	27	76	2,061	2,006	55	213	85	...	25	27	76
1939 or earlier	75,482	33,482	22,181	10,212	5,110	4,497	39,865	28,677	11,188	35,617	4,805	13,437	8,159	4,779	4,417
Not reported	2,478	910	398	359	303	508	884	569	315	1,594	341	234	297	214	508
<b>Standard Metropolitan Area of Dallas, Tex.—Dallas County</b>															
All occupied units	180,900	119,825	32,920	12,750	9,565	5,840	102,615	91,775	10,840	78,285	28,050	24,215	11,125	9,155	5,740
<b>HEATING EQUIPMENT</b>															
Central heating	33,135	22,841	4,794	1,910	1,797	1,793	22,273	20,762	1,511	10,862	2,079	3,712	1,602	1,689	1,780
Piped steam or hot water	10,228	5,392	1,971	988	775	1,102	5,254	4,449	805	4,974	943	1,441	812	689	1,089
Warm air furnace	22,907	17,449	2,823	922	1,022	691	17,019	16,313	706	5,888	1,136	2,271	790	1,000	691
Noncentral heating, with flue	29,562	17,990	5,257	2,984	2,354	977	14,605	12,718	1,887	14,957	5,272	3,799	2,633	2,289	964
Nonctrl. htng., without flue; or not htd.	112,603	75,498	21,816	7,440	5,171	2,678	62,983	56,040	6,943	49,620	19,458	16,005	6,562	4,955	2,640
Not reported	5,598	3,490	1,053	417	244	394	2,749	2,247	502	2,849	1,243	699	329	222	356
<b>YEAR BUILT</b>															
1945 or later	46,069	36,657	5,530	1,688	1,052	1,142	32,697	31,801	896	13,372	4,856	4,684	1,638	1,052	1,142
1940 to 1944	25,680	17,706	3,365	1,543	1,871	1,195	15,692	14,750	942	9,988	2,956	2,574	1,468	1,820	1,170
1939 or earlier	104,595	62,599	23,225	9,014	6,307	3,450	52,285	43,466	8,819	52,310	19,133	16,239	7,539	5,999	3,400
Not reported	4,563	2,867	803	505	335	53	1,942	1,759	183	2,621	1,108	721	480	284	28

\*The Standard Metropolitan area of Worcester, Mass., consists of the following parts of Worcester County: Worcester city, and Auburn, East Brookfield, Grafton, Holden, Leicester, Millbury, Northborough, North Brookfield, Shrewsbury, Spencer, Westborough and West Boylston.



FLOOR PLAN of Research Residence No. 2, where the experiments were conducted, shows register locations

## 2 Hp Condensing Unit Cools Small Home Effectively

**H. T. Gilkey, D. R. Bahnfleth, and R. W. Roose**  
University of Illinois

THE PRINCIPAL objectives of a recent investigation at the University of Illinois in Research Residence No. 2 were: a) determination of the cooling load and its hourly variation when cooling the Residence as a whole, except the basement, under both night and day conditions; b) determination of the time lags in heat flow through the walls and ceiling; c) comparison of the actual cooling load with the cooling load calculated using the procedure outlined in the 1952 edition of the ASHVE Guide; d) determination of the operating characteristics of a 2-ton mechanical refrigeration unit when outdoor air

A 2 ton condensing unit was installed in a Research Residence at the University of Illinois, and was connected to the air distribution system used for warm air heating. Some results: good temperatures maintained, though the unit's capacity was below design cooling load; and time lag of heat flow through walls was less than predicted, as was the measured heat flow through shaded walls and ceiling

was introduced into the structure through the unit at the rate of one air change per hr.

The Residence is a one story structure of frame construction with a large amount of glass exposure and with a full basement. The exposed wall section consists of cedar

shingles, 20 lb felt building paper, shiplap sheathing on 2 in. x 4 in. studs, 3½ in. mineral wool blanket insulation with vapor barrier attached, and ¼ in. plywood panels on the interior.

All windows and doors were weatherstripped and the windows on

the east and west exposures were equipped with canvas awnings. Except for one large picture window in the living room, which is fixed in place and consists of two panes, the windows are single glazed and of the horizontal sliding type. The doors are of conventional wood and glass construction. The south exposure of the Residence is shaded by a 3 ft 10 in. roof overhang. The cooling load on the structure, except for the windows, was calculated by the sol-air temperature method given in the 1952 ASHVE Guide, and the recommended method using the tables given in the Guide for calculating the heat gain through the windows was used. As recommended in the Guide, the infiltration load was based on a wind velocity of 10 mph and the actual lineal feet of crack around the doors and the windows.

The conditioned space consisted of all first story rooms. Table 1 gives a summary of the room dimensions and volumes, and a compilation of the calculated cooling load for each room is given in Table 2. The cooling load calculations were based on outdoor design conditions of 95 F dry bulb, 76 F wet bulb, and indoor conditions of 75 F dry bulb, 62.5 F wet bulb (50 per cent relative humidity). The maximum calculated cooling load on a design day for the structure with one air change per hr (120 cfm) of ventilation air mechanically introduced was 25,021 Btu per hr at 3:00 p.m. The maximum calculated cooling load on a design day for the structure with infiltration air only was 20,808 Btu per hr at 3:00 p.m.

### The Cooling Unit and the Duct System

The cooling unit was one of two sections of a year around air conditioner which was installed in the basement of the Residence. The conditioner occupied a floor area of 28 in. x 56 in. The furnace had a welded steel heat exchanger, and a burner sized for a rated input of 100,000 Btu per hr. The forward curved, multiblade centrifugal fan (hereafter referred to as a blower)

(Please turn to page 136)

Table 1—Data for Research Residence No. 2

A. Heat transmission coefficients, Btu per hr (sq ft) (F) .....							U
Insulated frame wall, with 3-5/8 in. mineral wool insulation .....							0.07
Insulated ceiling, with 5 in. mineral wool insulation .....							0.07
Outside door — front hall .....							0.51
B. Infiltration factors, cu ft per hr (ft of crack) .....							I
Door, weatherstripped .....							35
Window, weatherstripped .....							13
Fixed window in living room .....							8

Room	Dimensions	Ceiling Area*	Exposure	Net Wall Area	Glass Area	Volume
Living room	21 ft 10 in. x 13 ft 4 in.	308	East South	117 89	— 100 <sup>b</sup>	2480
South bedroom & alcove	13 ft 4 in. x 11 ft. 0 in. 4 ft 0 in. x 2 ft 3 in.	169	South West	71 93	28 25	1325
South bedroom closets (2)	4 ft 6 in. x 1 ft 11 in.	23	South	19	—	147
Bath	7 ft 8 in. x 4 ft 11 in.	44	West	36	11	320
North bedroom	11 ft 11 in. x 10 ft 4 in.	135	West North	66 61	25 30	1050
North bedroom closet	5 ft 10 in. x 2 ft 4 in.	18	North East	24 37	— —	166
Hall to bath	6 ft 7 in. x 5 ft 2 in.	43	—	—	—	289
Front hall	11 ft 6 in. x 4 ft 7 in.	59	North	22	21 (door)	448
Front hall closet	4 ft 0 in. x 2 ft 4 in.	9	—	—	—	91
Kitchen-dinette	19 ft 0 in. x 11 ft 4 in.	232	North East	124 89	42 12	1850
Total, first story		1040	—	848	273	8146

\*Ceiling area includes area of partition and exterior walls.

<sup>b</sup>South Living Room glass area includes area of outside door having a high glass to wood area ratio. Note: Ceiling Height of First Story — 8 ft 6 in.

Table 2—Compilation of Calculated Cooling Load for Research Residence No. 2

A. Maximum load (conducted and transmitted) at 3:00 p.m., Btu per hr				
Room	Windows	Exterior Wall	Ceiling	Total
Living room	3365	201	940	4506
South bedroom	3035	230	586	3851
South bedroom closets (2)	•	•	•	•
Bath	880	36	256	1172
North bedroom	3110	156	505	3771
North bedroom closet	•	•	•	•
Hall to bath	•	•	•	•
Front hall	214 (door)	18	180	412
Front hall closet	•	•	•	•
Kitchen-dinette	1447	268	709	2424
Totals	12,051	909	3176	16,136

B. With ventilation air				
	Sensible	Latent	Totals	
Heat gain to rooms	16,136	—	16,136	
Load of blower	700†	—	700	
Ventilation load	2,390	3,320	5910	
Total for system			22,746	
10 per cent miscellaneous gains			2275	
Grand Total			25,021	

C. With infiltration but with no ventilation air				
	Sensible	Latent	Totals	
Heat gain to rooms	16,136	—	16,136	
Load of blower	700†	—	700	
Infiltration load	913	1167	2080	
Total for system			18,916	
10 per cent miscellaneous gains			1892	
Grand Total			20,808	

\*Cooling load for these rooms included with larger adjoining rooms.  
†Measured load.



MECHANICAL EQUIPMENT was used (left) to bring the salt water from the bay into contact with the corrosion test specimens in the laboratory. Natural corrosion was photographed (right) to show the damage which can result from the corrosion processes which were illustrated in detail by the bench experiments

## Contractor Reviews Corrosion Film

Lawrence E. Gichner

... which offers important information to sheet metal men to whom stainless steel and monel are becoming increasingly important

THE FILM, *Corrosion in Action*, recently shown for the first time before the Washington Society of Metallurgists, can offer important information to the sheet metal contractor.

The contractor can be of inestimable help to his customer if he has some knowledge of the causes of corrosion. Rust is now costing the American people some \$6 billion annually, and sheet metal men can help prevent some of this heavy loss.

The message of this film is that selecting the right metal, using it in the right place and in the right way, can do much to reduce atmospheric corrosion.

Parts of this three reel color film are technical, parts are non-technical. The technical parts are lucidly presented, and though an untutored viewer may miss chemical details, the general processes taking place are made clear.

### Film Offers Basic Information

The first part starts with examples showing the economic importance of corrosion. Then follow some illustrations of the several forms in which corrosion

damage can occur. There is a short history of the development of the electrochemical theory of corrosion and the contributions made to it by certain investigators during the past 125 years. This leads to an exposition of the electrochemical theory, showing in detail what occurs at the anode and cathode areas in a corrosion cell as a result of the passage of the electric current that causes corrosion. The role of oxygen as a promoter of cathodic reactions is described and its influence on corrosion is illustrated by bench experiments.

The second section begins with a discussion of the standard electromotive series which lists metals with respect to their basic reactivity. It also indicates which metals can replace others in solution. These phenomena are illustrated by bench experiments and animation. This leads to a discussion of galvanic action and there are dealt with in turn the importance of potentials, polarization, current density and area effects. The development of corrosion currents by differential aeration and metal ion concentration cells is shown as is the existence of anodes and cathodes on corroding metal

(Please turn to page 112)



ANOTHER CASE OF  
**Copper**  
WHERE IT COUNTS

**AMERICAN STORES  
BAKERY AND WAREHOUSE,  
PHILADELPHIA, PA.**

**22 TONS OF REVERE COPPER USED  
FOR EXPANSION JOINTS, FLASHING,  
FASCIA, AND VENTILATOR HOODS**



**ACRES AND ACRES** of roof with 4,000 ft. of 4 ft. girth, 20-oz. Revere Copper expansion joints guarding against an invasion by weather. Non-rusting, enduring Revere Copper was also used for the fascia, ventilators and for flashing around the rising walls.

When you have 8,000 squares of flat roofing, you have yourself a roof. That's what was involved in this Acme Market's roof that covers their bakery and warehouse. It stretches for 5 city blocks. And in Philadelphia the blocks are long! The vastness and very nature of the construction of this roof dictated copper in the vital spots. For this roof must endure for many years, require the absolute minimum in maintenance and do a thoroughly efficient job of protecting the foodstuffs stored beneath it. On top of that, with 4,000 ft. of expansion joints, the material used had to be rugged enough to withstand abuse yet readily workable and economical to install. Also it had to be able to shrug off year after year of contraction and expansion. Copper dovetailed into this pattern perfectly.

Actually, copper fits perfectly into many patterns. There is not another single metal or alloy that has all the outstanding construction characteristics of copper. Its endurance has been proven over centuries of use. It is readily worked into any desired shape. It solders to perfection. It requires no painting. And it can't rot or rust.

The end use restrictions on copper a while back did more to point up its importance in building construction than anything that we might print about it. Architects, builders and contractors told us at that time that there are places in building where there just is no substitute for copper.

Now, with restrictions on the use of copper ended there



**ARCHITECTS FOR THIS** colossal flat roof were Ganteaume & McMullen, Boston, Mass. Roofing and Sheet Metal Work—Warren-Ehret Co., and L. William Ewing Company. Hughes-Foulkrod Company was general contractor, while the Revere Distributor was Merchant & Evans . . . all of Philadelphia.

isn't any reason why your next job can't have the many benefits of Revere Copper. See the Revere Distributor nearest you about Revere Sheet, Strip or Roll Copper for flashing. Particularly ask him about the money-saving advantages of Revere Keystone Thru-Wall Flashing\*. And, if you have technical problems, he will put you in touch with Revere's Technical Advisory Service.

\*Patented

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**COPPER AND BRASS INCORPORATED**

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*Heating dealers . . . don't miss  
the big profit opportunity of*

# HONEYWELL ELECTRONIC MODUFLOW



*featuring the sales-winning appeal of an Electronic Thermostat outside the house*

Here's why leading dealers everywhere are finding Electronic Moduflow a top profit-maker!

*Moduflow provides the constant comfort everyone wants by using two thermostats—located outside and inside the house—to keep indoor temperatures tuned to outside temperature changes.*

*Moduflow is easy to sell!* Once prospects see how Moduflow uses an *outdoor* control to *vary* indoor temperatures according to weather changes, they're easy to sell. In fact, Moduflow is packed with all kinds of unusual, different features that can't be found on ordinary control systems.

*Moduflow is easy to install.* The new, simplified Moduflow system is easy to wire and calibrate.

*Moduflow is easy to service.* Because it's *electronic*, and has no moving parts, Moduflow is simple to service.

*Moduflow is ideal for any home.* Everyone is a prospect for Moduflow, provided they have central heating and adequate distribution facilities. Thus there's no limit to prospects—and one Moduflow customer always leads you to another.

*Get started now on Electronic Moduflow!* Find out how easy it is to sell—and you'll see why it's one of the most outstanding profit opportunities for heating dealers in years!

## *What leading heating dealers say about Electronic Moduflow*



**Peter McAlpine, Detroit:** "... the greatest heating control advance in recent years."



**H. J. "Red" Brobst, Cleveland:** "... completely different from ordinary control systems."

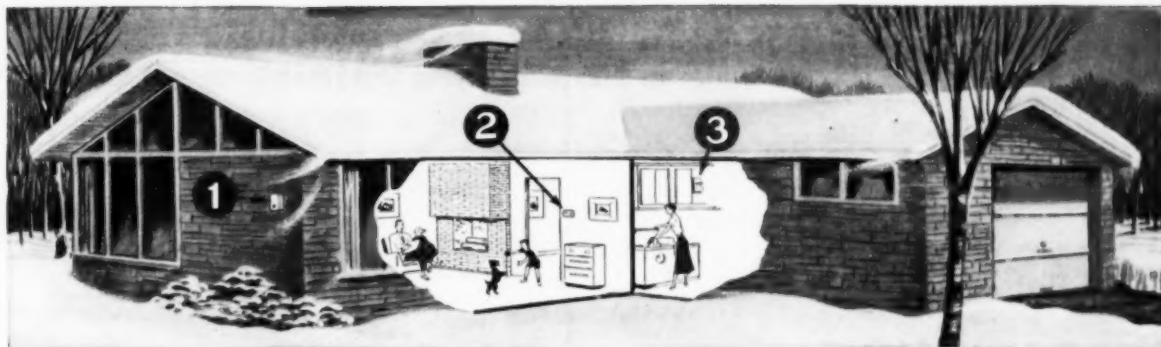


**Claude Klingaman, Gary:** "90% of my customers are now asking for Electronic Moduflow!"

## *National advertising helps pre-sell your prospects*

Your prospects are seeing interesting, hard-selling ads on Moduflow in national magazines, which

help make your selling job even easier. In addition, literature, displays and other material are available.

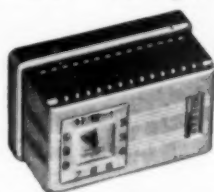


Here's how **Electronic Moduflow** works. The sketch above shows how Moduflow's three main electronic units

work together to vary indoor temperatures automatically according to outdoor temperature changes.



**1** Electronic Weathercaster, outside, automatically raises or lowers control point of indoor thermostat, when outdoor temperature changes.

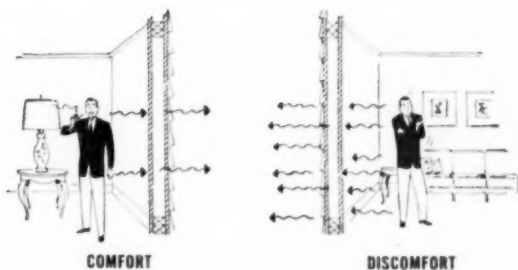


**2** Electronic Clock Thermostat, inside, measures indoor requirements and sets percentage of burner "on" time needed to hold control point.



**3** Electronic Relay Amplifier receives these signals and then cycles the burner according to the percentage rate set by the indoor thermostat.

## Moduflow provides better comfort by varying indoor temperatures



### Why people need varying temperatures

Tests show if indoor temperature is merely held constant when outdoor temperature falls, a person inside *feels* uncomfortable. This happens because as walls become colder, they "draw" heat from the body.



### "Cold wall" problem solved by Moduflow

With temperatures at 50° (top sketch), occupants feel comfortable when indoor temperature is 71°. But if it drops to 12° (sketch above); heat loss increases, so *higher* indoor temperature is needed to compensate for colder walls. Moduflow does this *automatically* by raising control point of indoor thermostat.

MINNEAPOLIS  
**Honeywell**



*Electronic Moduflow*

MINNEAPOLIS-HONEYWELL REGULATOR CO.  
Dept. AA-7-92, Minneapolis 8, Minnesota

Gentlemen: Please have your representative show me your "Dealer Profit" program for Electronic Moduflow.

Name .....  
Address .....  
City ..... Zone ..... State .....

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The First *Completely Automatic*  
**DEHUMIDIFIER** with  
*Consumer Demanded* Features



with Exclusive  
Safety-Lite  
and  
Flote Switch

Only **Viking ARID-ZONE**

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- **CONSTANT PROTECTION** —  
Lets owner breathe easily on hot humid days. Protects paint, plaster, furnishings, metal surfaces, wood furniture and paneling.
- **12 QUART CAPACITY** —  
The unit's 24 hour capacity—12 qts. of condensed moisture which is held in a porcelain enameled water container.
- **EASY WATER REMOVAL** —  
Just pull out no-drip water container when Safety-lite signals and empty in drain. It's as easy as carrying a bucket.
- **PERMANENT DRAIN OPTIONAL** —  
If buyer wants a connected drain, parts are furnished. Drain-stoppage is then warded off by Safety-lite and automatic shut-off.
- **PORTABLE—EASY TO HANDLE** —  
Only 18" high, unit can be moved into any room, basement or closet. Just plug it in and unit goes to work.
- **QUIET, EFFICIENT OPERATION** —  
Running vibration is absorbed by heavy rubber feet upon which cabinet is mounted. Costs only a few pennies a day to operate.



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Mr. E. M. Cooley  
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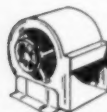
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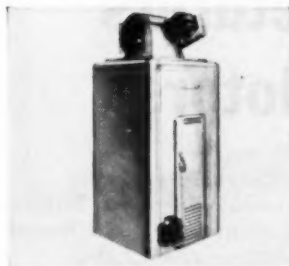
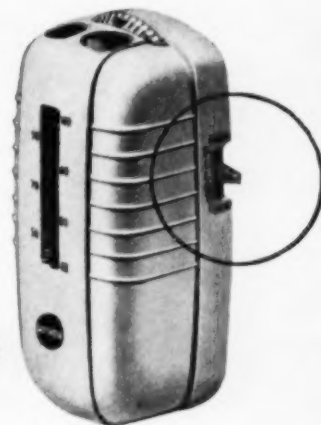
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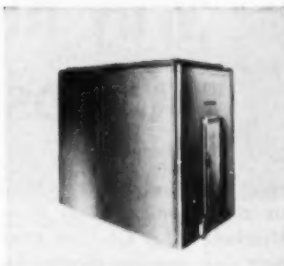
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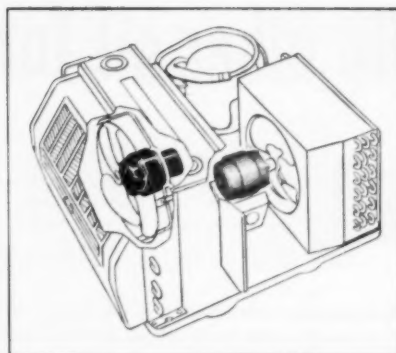
Duo-Therm Div. of Motor Wheel Corp., Lansing 3, Michigan  
Dept. AA

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This Mitchell unit uses G-E shaded pole motors to drive the condenser and evaporator fans.

This room air conditioner both cools and heats to provide year-around living comfort.



## Why Air Conditioner Manufacturers Choose G-E Shaded Pole Motors

Many air conditioner manufacturers know that *quality* air conditioning units must have *dependable* motors. Mitchell Mfg. Co., for example, specifies G-E shaded pole unit bearing motors for their air conditioner. . . . Here's why —

Motor is lubricated for life . . . the customer never has to add oil.

Motor runs quietly. Whether you turn it on day or night, special motor construction helps give smooth operating performance.

Motor easily adaptable to multi-speed operation and

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Whether you make air conditioning units, furnace fans, window fans or similar equipment . . . G-E shaded pole motors can help you sell *your* product, too.

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**GENERAL  ELECTRIC**

# "SKIL Tools need least maintenance... prove most dependable, adaptable to custom work!"

says **Richard E. Walsh**, owner,  
**Thomas Finn Co.**, St. Paul, Minn.



Mr. Walsh, head of this 55-year-old sheet metal firm, is past president of the National Association of Sheet Metal Contractors, and now president of the Sheet Metal and Roofing Contractors Association of Minnesota. He says, "All of our work is custom made. We must have dependable, adaptable tools. We have used SKIL tools for over 20 years with finest results. Not only do they give us adaptability, but the local SKIL factory branch gives us a hand with production problems, helps us save a great deal of time and labor."

"We have a SKIL Disc Sander, Driver, Drill and Hacksaw attachment. These tools require almost no maintenance or repair."

**SKIL Disc Sander Model 11** is used here by Louis Mosner to sand a light housing for a wrecker truck. He says, "This sander is by far the best! It's the *one* sander I have used that gives a precision sanding job. It handles *perfectly* with the right power and balance!"



## SKIL 7" Disc Sander—Model 11

Heavy duty. Ideal for removing weld marks on sheet metal; for auto body, truck and tank repair work; for cleaning concrete forms. Also suitable for many wire brushing and grinding operations. Disc diameter: 7". No-load speed: 4200 r.p.m. Overall length: 16 $\frac{1}{2}$ ". Net weight 11 $\frac{1}{4}$  lbs.

## SKIL Hacksaw Attachment

For all portable drills of 1800 to 3500 r.p.m. Converts drill for fast sawing or filing; uses standard or broken lengths of hacksaw blades. Supplied with blade and file holders, hex key, drive pin adapter, steel cutting blade.



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# Once is not enough!

The need for blood is greater than ever, not only for men wounded in combat, but here at home . . . to cure disease, to meet accidents and disasters, and to prepare for civil defense.

Our quota can **ONLY** be met, if those who give *keep on* giving . . . regularly!

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Remember . . . once is **NOT** enough. Give blood again and again! Call your Red Cross, Armed Forces or Community Blood Donor Center for an appointment to give blood today.

# GIVE BLOOD

...give it again and again

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- ☐ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ☐ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ☐ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ☐ HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- ☐ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ☐ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ☐ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
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- ☐ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

Remember, as long as a single pint of blood may mean the difference between life and death for **any** American . . . the need for blood is **urgent!**



**NATIONAL BLOOD PROGRAM**



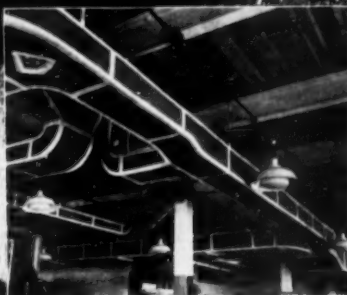
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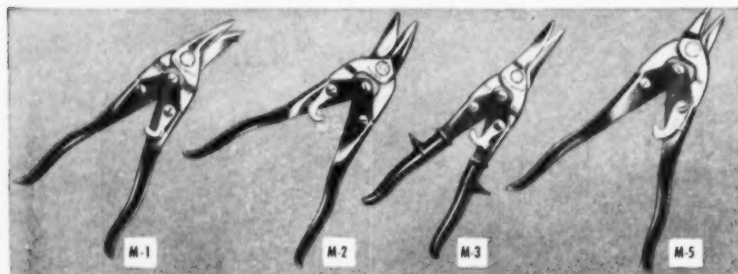
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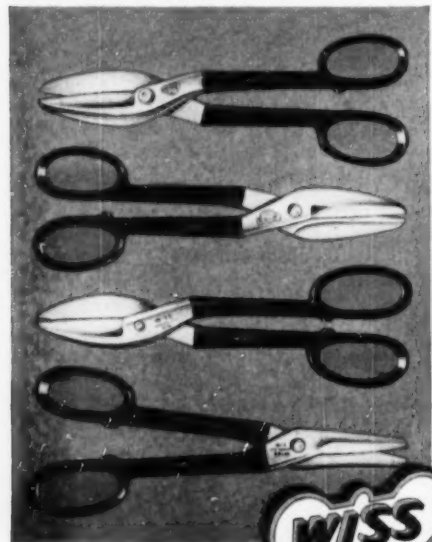
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*M. E. Robertson of the Briggs-Weaver Machinery Co., Dallas, Houston and Fort Worth, Tex., agrees with other distributors of Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with least effort.*



**WISS METAL MASTER SNIPS:** Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.



## WISS INLAID SNIPS

High carbon crucible steel welded to a hot drop-forged frame provide that extra service demanded by professional users everywhere. Six Straight Cutting sizes from 9½" to 17", including Bulldog Snips for notching. Three Combination® Cutting sizes, 12½", 13½" and 14½".

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®Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.



Wiss inlaid blades are made of high carbon crucible steel welded to a hot drop-forged frame to provide the extra service demanded by professional workers.



Wiss snips are hot drop-forged of the finest steels available.



Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

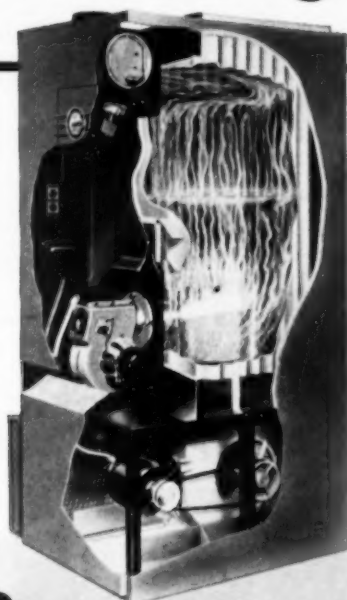
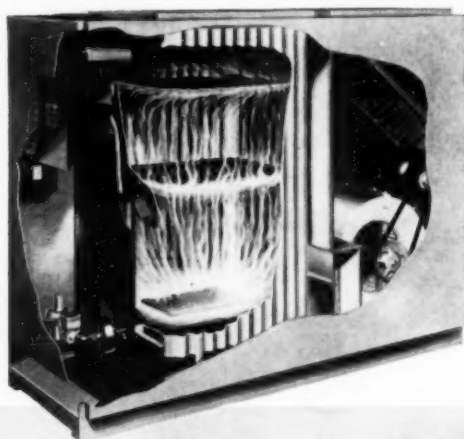
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- You make extra profits . . . by selling winter heating AND at the same time selling summer cooling. Or—install summer cooling at a later date, if customers prefer.
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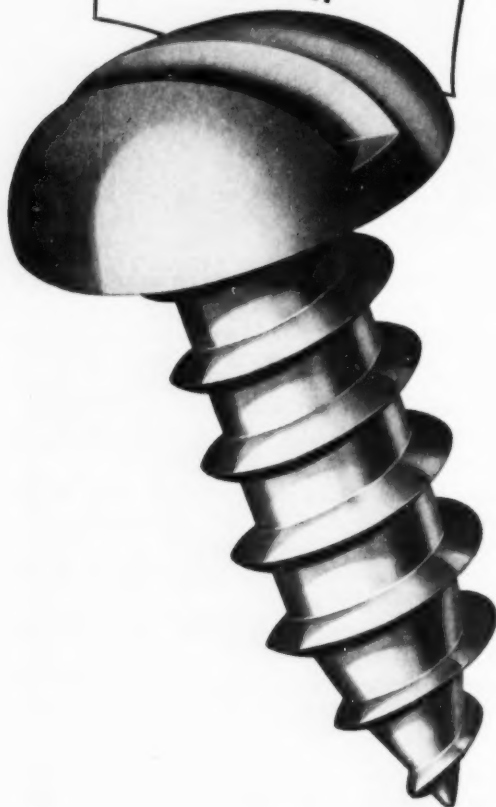
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STILL

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SHEET METAL SCREW

WITH SHEET METAL MEN

THE ORIGINAL  
PARKER-KALON  
TYPE A



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"My dad put me wise to the difference in Sheet Metal Screws. He's used P-K Type A since he first started the business and never found anything to equal them."

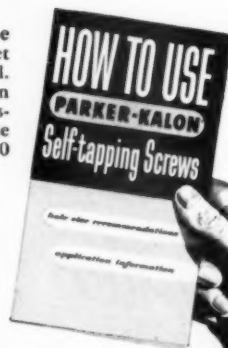


"There's a 'best buy' in everything, and in Sheet Metal Screws we've found it's Parker-Kalon. Hardness and toughness is balanced just right, and threads are sharp and clean from head to gimlet point—in every screw. And that saves time . . . plenty!"

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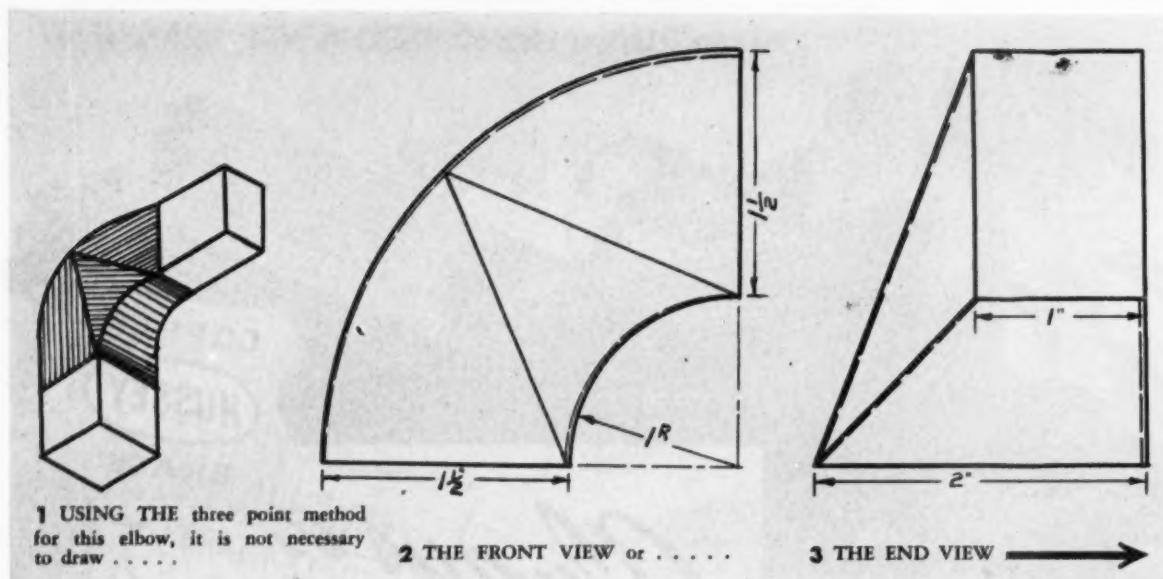
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## Making a Rectangular Transition Elbow

A three point "jump" method is used to develop two different transition elbows used in residential heating and air conditioning

**Hugh B. Reid**

**Instructor, Sheet Metal Pattern Drawing**

IN THE JULY 1952 issue of *American Artisan*, a pattern problem was presented for a transition 90 deg rectangular elbow symmetrical about both center lines. A comparison was drawn between the gradual slope design elbow and the three point "jump" method in which the offset side is formed by braking. Here presented is a step by step analysis of the development of two different transition elbows commonly used in residential heating and air conditioning installations in which the three point method is used. Note that in developing the patterns, it is not necessary to draw Figs. 2 and 3. The work lines A, B, and C shown on the straight side pattern, Fig. 4, with their corresponding rise shown on the back pattern, Fig. 5, and the throat pattern, Fig. 6, will produce the true length lines necessary to develop the offset side pattern, Fig. 7.

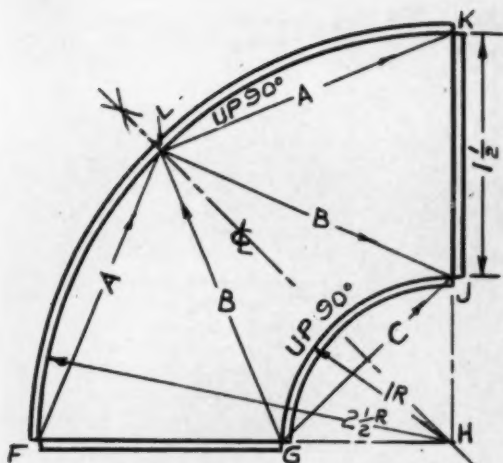
In the design of air supply or exhaust systems, the static pressure, which is the pressure the air volume exerts against the inside walls of the duct, must be calculated so that a motor of adequate horsepower can be installed

to overcome this static pressure. It can be readily understood that air being forced through a trunk line by the centrifugal motion of a fan will meet with more resistance going around an elbow than it would going through a straight duct, and the sharper the bend the greater will be the static pressure at any given velocity. Convenient air friction charts have been set up giving the friction loss in inches of water per 100 ft of duct at the various volumes and velocities of air moving through different duct sizes.

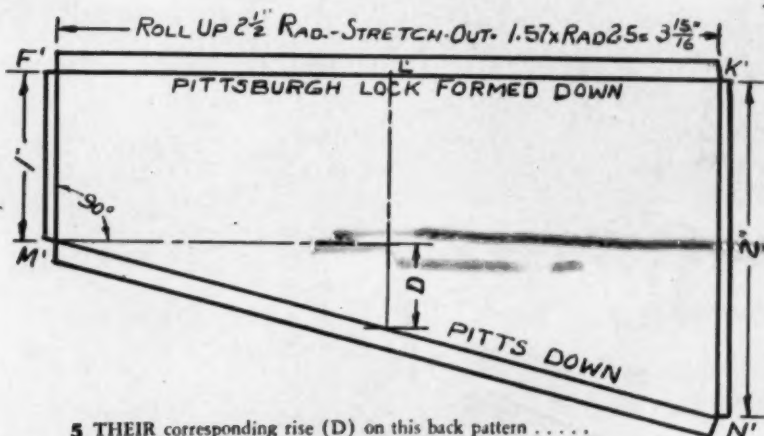
In the elbow friction chart (at right, above) an empirical length of straight duct equivalent to the various elbow bends and sizes is given.

As an example — a duct 24 x 12 has an area of 288 sq in. A duct of this area handling 1500 cfm at 820 fpm will have a static pressure equal to 0.05 in. per 100 ft of duct, or 0.0005 in. per ft. Selecting a sharp corner elbow with no vanes for a duct 24 in. wide, the equivalent length is given at 50 ft.

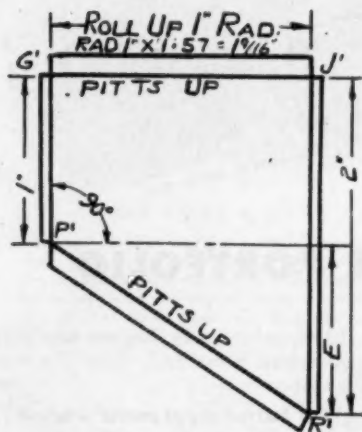
(Please turn to page 112)



4 SINCE WORK lines for this straight side pattern . . . .



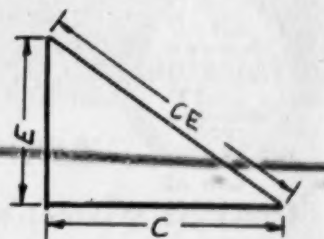
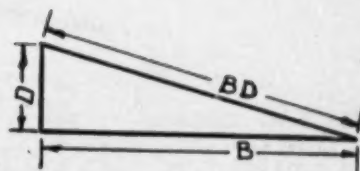
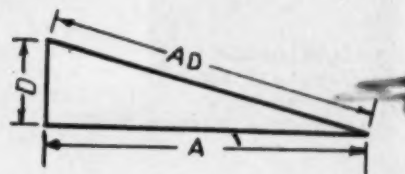
5 THEIR corresponding rise (D) on this back pattern . . . .



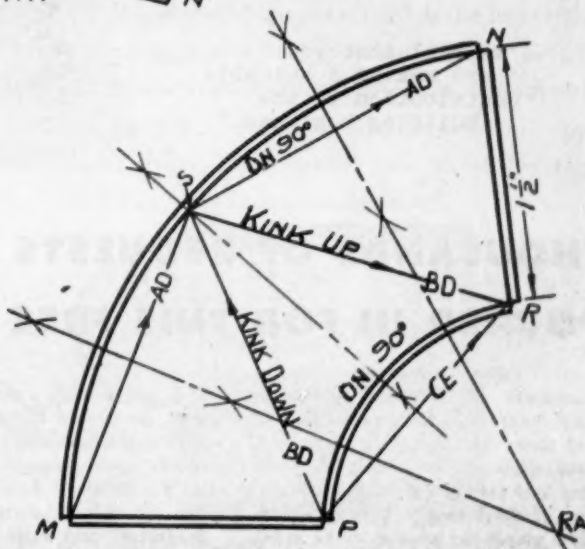
6 AND THE throat pattern will produce the true length lines needed for . . . .

DUCT WIDTH INCHES	90 DEG ELBOW			45 DEG ELBOW
	ROUND CORNER (MINOR VAINES)	SHARP CORNER WITH VAINES	SHARP CORNER NO VAINES	
14"	10	15	40	5
24"	15	20	50	10
34"	20	30	60	10
44"	30	40	70	15

ELBOW FRICTION CHART



DEVELOPMENT OF true length lines for fig. 7



7 DEVELOPING this offset side pattern

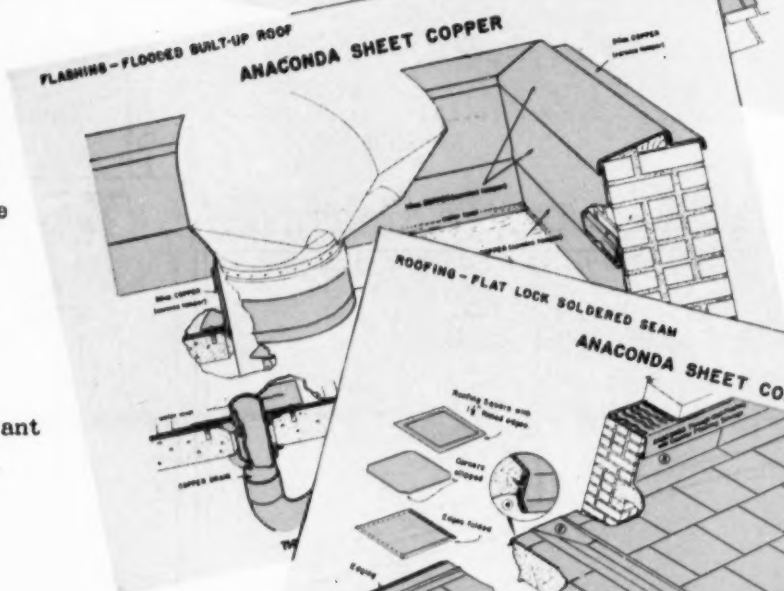
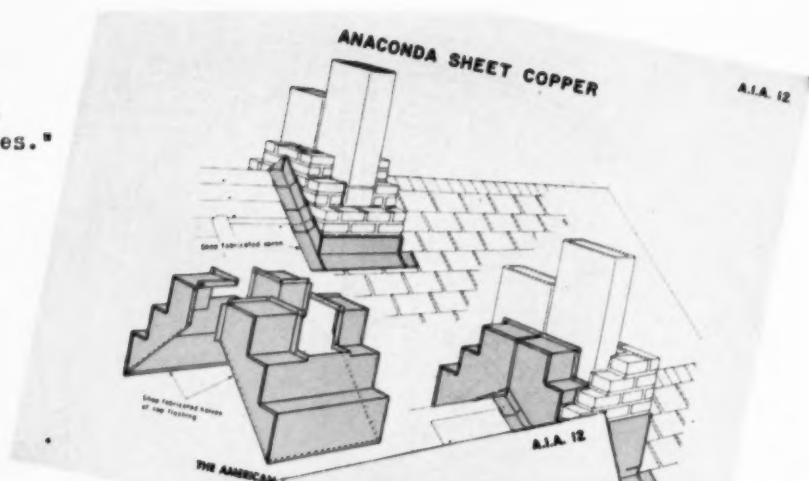
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Thousands of architects and sheet metal contractors have asked that we send them the Anaconda portfolio of detail drawings suggesting new designs and installation methods for all types of sheet copper work. The comments above are typical of hundreds of letters we have received telling us how helpful these drawings have been.

If you haven't a set of these drawings, we should like to send you one with our compliments. Simply write us on your company letterhead and ask for Portfolio S. We are sure that you, too, will find these drawings great timesavers and a short cut to sound design and good workmanship. *The American Brass Company, Waterbury*

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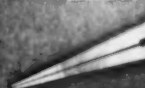
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*are individually tested!*

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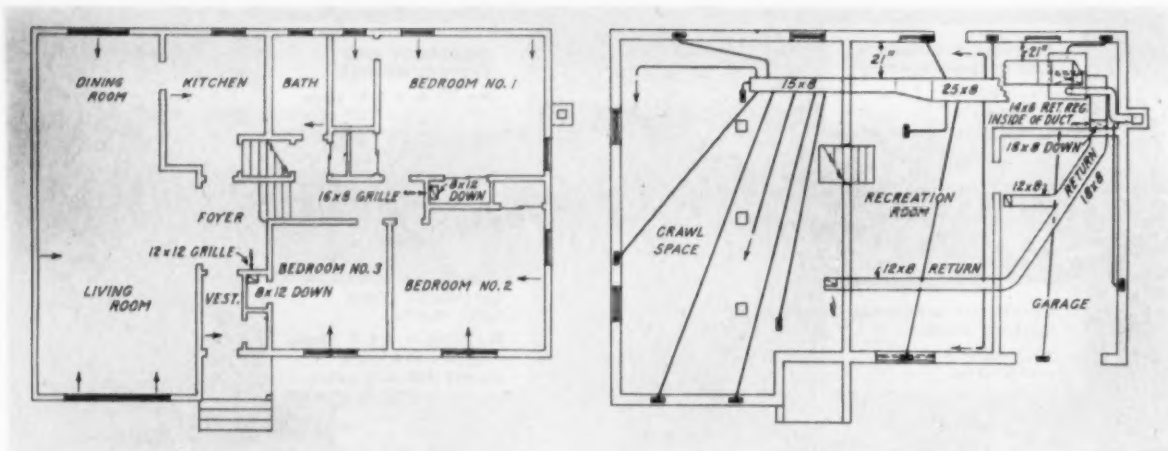
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**CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK**



1 PERIMETER DISTRIBUTION systems serve a group of project homes of which the first floor plan (left) and the basement plan (right) are typical

good planning makes

# Air Conditioning Project Homes

. . . profitable venture for Long Island  
heating dealer who arranges work to assure  
efficient use of men and materials

EVERY WARM AIR heating dealer knows that he may lose money on housing project work (which involves smaller profit margins per unit) if he fails to watch the little, time consuming jobs that eat up a working-man's day. The heating contractor for the Beachway Estates at Port Washington, L. I., H. Klein & Sons, decided to use a production line assembly plan for installing the heating and cooling systems in the project.

The floor plans were studied to decide upon the best duct layout to provide year 'round comfort for the type of house being erected. The first floor plan (Fig. 1, left) shows the register locations for each of the first floor rooms of a sample house. All floor plans were not the same as that shown, but in general they were simi-

lar and were adaptable to a single air distribution plan as illustrated at the right in Fig. 1 (basement plan).

It will be noted that each room is adequately supplied with perimeter outlet registers and that two return openings are used instead of one common return. No effort was made to reduce the cost of the air distribution if it was thought that performance would be limited under any situation that might exist throughout the year. This is evident by the openings supplied to the crawl space and basement — both the latter being completely air conditioned, as are the rooms above.

It was decided to use an extended rectangular plenum duct system with small round duct being used for the take-off supply runs. Fig. 2 is a

breakdown of the component parts of the supply duct. All lend themselves to easy assembly and are adaptable to varying lengths of the different runs.

## High Static Pressure Maintained

The same type of conditioning equipment is used for all houses in the project. It is a single packaged year 'round unit containing a 3 hp cooling system, a gas-fired furnace and a blower capable of developing 0.4 in. static pressure. This is a higher static pressure than most pieces of equipment of this type normally supply, but because of the numerous supply openings, the dual return system, and the added volume of air needed for summer cooling, it was believed advisable to provide

equipment that would meet the needs of the building at any time during either the heating or cooling season.

Normally, the return side of a small duct system is designed for 0.05 in. static pressure. However, with the dual intake and longer run of duct it was calculated that this system would have an approximate resistance of 0.1 in. static pressure. The remaining 0.3 in. static pressure was more than adequate for the supply run with the greatest resistance, which was calculated to be a total of 120 equivalent feet.

### Suggestions from Mechanics

Once the duct system had been decided upon and the equipment selected, a mock-up of the plan was made and various techniques were tested (Fig. 3). Sheet metal journeymen were asked if enough working room was available and if the duct runs were falling in the best locations to make for the fewest joints. The man who was to do the actual work of installing the heating and cooling unit was asked to comment upon the location of the supply and return registers, whether or not he could effectively balance the air flow with these locations, and whether there was adequate servicing room around the equipment.

Everyone else who might have been involved in this project was asked for suggestions. Each suggestion was carefully checked and coordinated with the recommendations of the other trades involved. In

this way, it was thought, the installation time would be reduced to a minimum.

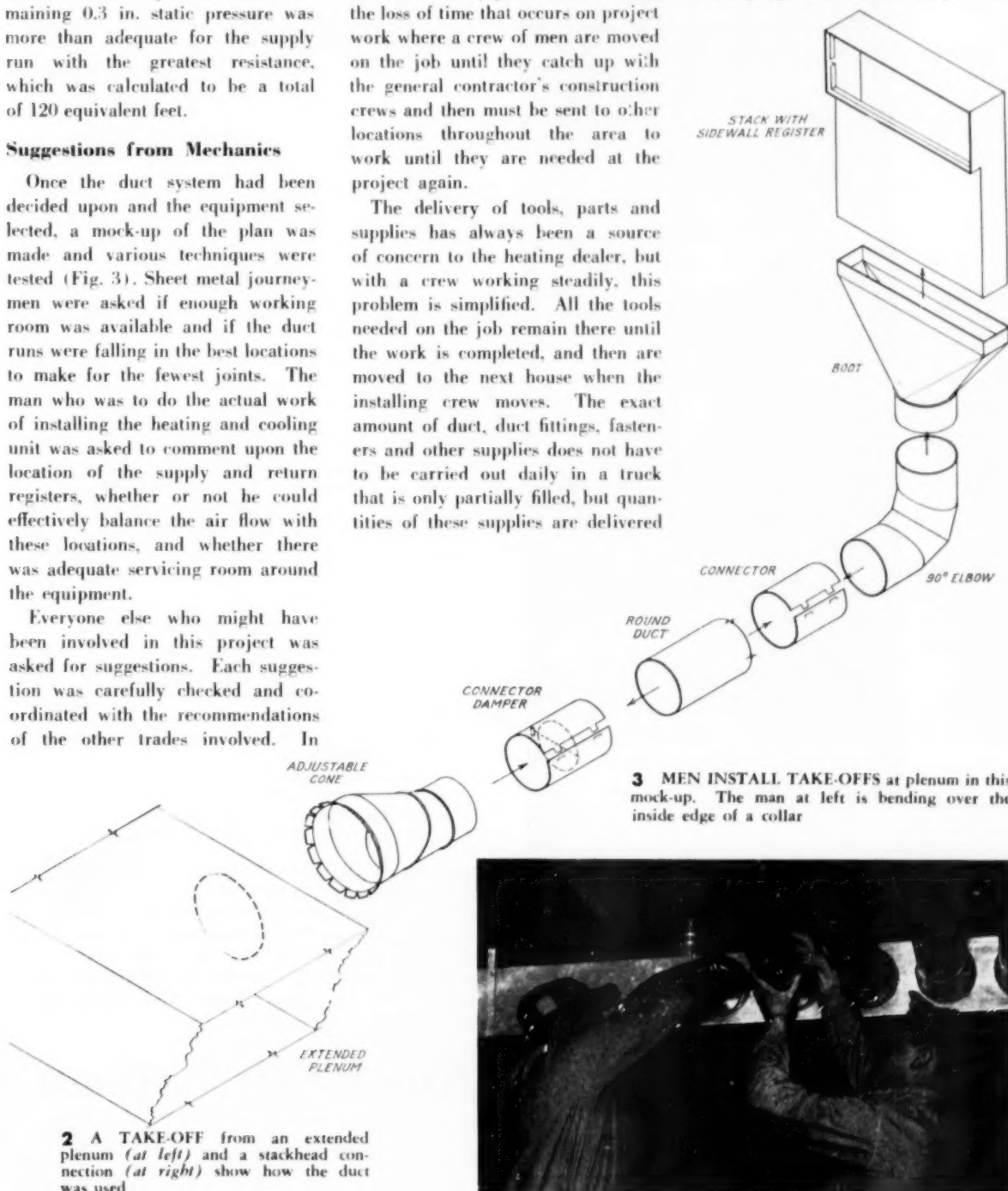
### Plan Assures Steady Work Pace

The general contractor had planned to build the houses at such a rate that a crew of installers could be assigned to the project and could work at a steady pace. This reduced the loss of time that occurs on project work where a crew of men are moved on the job until they catch up with the general contractor's construction crews and then must be sent to other locations throughout the area to work until they are needed at the project again.

The delivery of tools, parts and supplies has always been a source of concern to the heating dealer, but with a crew working steadily, this problem is simplified. All the tools needed on the job remain there until the work is completed, and then are moved to the next house when the installing crew moves. The exact amount of duct, duct fittings, fasteners and other supplies does not have to be carried out daily in a truck that is only partially filled, but quantities of these supplies are delivered

in a full truckload and distributed to the buildings where they are needed. There is always a supply on hand in case a mistake is made in ordering the quantity of material needed to complete a job.

Because plans were carefully made at the beginning of this project, many savings are being recorded as the work progresses toward completion.

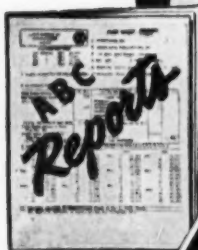


# Oh! **WHERE**... *is my wandering ad tonight?*



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**T**HERE are two ways to buy advertising space. One is the guesswork-opinion method. The caption above is the mournful song of an advertiser who is still selecting media the way it was done before World War I, when there were no standards for the circulations of published media and when there was no accepted and approved method of auditing circulations. In those days, advertisers O.K.'d their proofs and sent out their advertising with a prayer that some of their sales messages would find their way to market.

The other way to buy space is the factual, know-what-you-get-for-your-money method. Today advertisers can start their investments on a basis of facts by selecting media with the help of the information in the reports issued by the **AUDIT BUREAU OF CIRCULATIONS**. This cooperative and nonprofit association of 3300 advertisers, advertising agencies and publishers, organized in 1914, has established standards that make it possible to evaluate the circulations of published media. The A.B.C. maintains a large staff of experienced and specially trained circulation auditors who make annual audits of the circulations of publisher members. A.B.C. reports give the facts thus obtained.

Here are some of the audited facts about business papers that A.B.C. reports tell the advertiser:

- how much paid circulation;
- how much unpaid;
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- where they are located;
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## **American Artisan**

**A.B.C. REPORTS—FACTS AS THE BASIC MEASURE OF ADVERTISING VALUE**



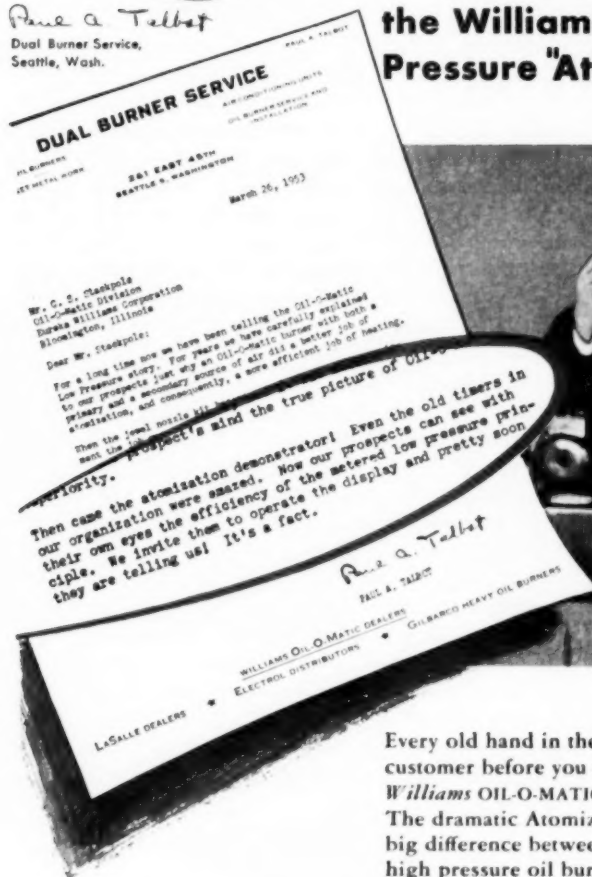
Paul Talbot, Dual Burner Service,  
Seattle, Washington, reports:



Paul A. Talbot  
Dual Burner Service,  
Seattle, Wash.

# Even old timers were amazed...

at how easy selling becomes with  
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Pressure "Atomization Demonstrator"



Every old hand in the heating business knows that you've got to convince the customer before you close the sale . . . and now they're finding out that Williams OIL-O-MATIC has the fastest way in the world of doing just that. The dramatic Atomization Demonstration gives positive *visual proof* of the big difference between OIL-O-MATIC Metered Low Pressure and ordinary high pressure oil burners. Customers are amazed when they see it . . . and heating salesmen are even more amazed when they see how easy it is to sew up OIL-O-MATIC sales.

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**Williams Division**

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**Better Products, Better Made** *for better living!*

# How to Store Sheet Metal

**. . . and how wholesalers can help dealers increase business volume were among the topics covered at the spring meeting of the National Association of Sheet Metal Distributors**

THE PROBLEM OF sheet metal storage is an important and complicated one to the distributor who serves warm air heating and air conditioning dealers, sheet metal shops, and other users. A. M. Roberson, C. M. McClung & Co., offered some solutions to the members of the National Association of Sheet Metal Distributors at their 43rd spring meeting, held in Columbus, Ohio. He pointed out that large warehouses, with specially designed buildings, cranes, and hoists, and numerous labor saving devices, have been able to work out very efficient storage methods.

However, when the smaller, less specialized distributor thinks of such modernization to cut costs, figures often show that the savings effected are not commensurate with the additional investment, he pointed out. The savings per ton in handling costs may not equal the allowed depreciation plus an expected return on the additional investment.

Adding to the problem is the increasingly diversified demand on the part of dealers, which means that a more and more varied stock of sheet metal must be stored by distributors. "In pre-war days," Mr. Roberson said, "a few stacks of 36 x 96 in. galvanized sheets in a few gages from 20 to 28 sufficed. These few sizes stacked closely together occupied only 120 sq ft of floor space and complete with aisle space between each two stacks, the total space used was about 170 sq ft. Adding about four items of one type of galvanized roofing, you could store the whole lot with aisles in less than 325 sq ft."

Today, Mr. Roberson pointed out, such an inventory is impossible. He described a recent survey of brake capacities in one of his company's territories; it was learned that over 75 per cent of the brakes would handle 10 ft and longer sheets, and that the fabricators wanted longer and wider sheets than the company was handling. "So the 36 x 96 in. grew to 48 x 120 in., and longer, with some narrower widths. Hot rolled and cold rolled sheets were added, in addition to newly developed superior quality sheets," Mr. Roberson recounted.

## **How a Diversified Stock is Handled**

Taking as an example one of his company's warehouses, Mr. Roberson pointed out how this diversified stock may be handled. Aisles are about 54 in. wide, to handle the widest of the sheets. These aisles consume about 25 per cent additional space.

"Since we cannot use fork lift trucks to unload from box cars (trucks cannot be maneuvered through the door), we feel the lowest cost method is to hand load flat trucks and roll to stack location. To facilitate unloading from flats to stacks, we use the fork lift," he explained. When the flats are loaded, 2 x 4's are laid down for fork clearance and are used every 15 to 20 bundles for spaces. When sheets are lifted from the flats, a 2 x 4 is laid lengthwise on top of the sheets, and a log dog clamp is attached so that it will slide on each end of the 2 x 4. These clamps then engage 15 to 20 bundles on each end, preventing them from sagging and permitting the load to be hoisted horizontally to its stack. This method can be used only on stacks where aisles are wide enough to accommodate fork lift trucks.

Mr. Roberson pointed out that after experimenting with many methods, his company concluded the "Churchill formula — blood, sweat and tears" to be the lowest cost method. "All our sheets are floor stacked and they take up too much room," he said. The company's unloading costs vary depending on the type of material and whether or not extra labor is required. "We have been able to unload and stack a car of galvanized roofing at as low as 39 cents a ton, and flat sheets will average 50 cents a ton," he said.

Mr. Roberson said he had surveyed distributors and was surprised to find that no one had been able to devise a system for storing and handling sheets more economically. He went on to describe certain racks developed on the "Christmas tree principle" but pointed out that the system requires very wide aisles for the fork lift truck. Mr. Roberson said that his company tries to stack sheets along the main aisles used by the trucks in order to get maximum use of the truck and to take up the minimum aisle space.

## **How Much Zinc on Galvanized Sheet?**

"Don't forget that the heavier the zinc coating, the longer the rust-free life of the galvanized sheet," E. V. Gent of the American Zinc Institute urged the distributors. He went on to say the institute would like to see all roofing sheets carry the "Seal of Quality" 2 oz coating and suggested that distributors buy and sell sheet that is marked with the weight of zinc coating according to ASTM specifications. This would mean "selling quality, not price," he said, adding that "every buyer wants to know what he's buying."

Engineered for DEPENDABILITY

# Delco Motors

Careful dynamic balance is only one reason why Delco motors are preferred by many leading manufacturers of heating and ventilating equipment.

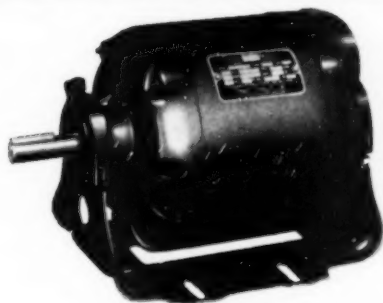
An impressive list of features contributes to Delco's enviable record for continuous, trouble-free performance. These features include uniflow pressure-cast rotor conductors, steel-backed tin babbitt sleeve bearings, cored oil wells, varnish-dipped and baked motor windings. Careful selection of materials, too, is a big factor in enabling Delco motors to give longer, more dependable service.

The motors you need for your products, in sizes from fractional to 100 h.p., are in the great Delco line. For information on motors for any application, address Delco Products, Dayton, Ohio, or our nearest sales office.



**MOTORS FOR OIL BURNERS**  
Delco Range-mounted motors, split-phase— $\frac{1}{6}$ - to  $\frac{1}{4}$ -horsepower ratings.

**THE BEST RUNNING MATE YOUR PRODUCT CAN HAVE**



**MOTORS FOR BLOWERS**  
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## DELCO PRODUCTS

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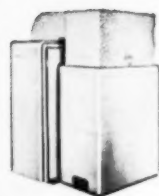
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NOW! MORE COMPLETE  
THAN EVER!

## EVERYTHING YOUR CUSTOMERS REQUIRE . . .

Summer Air Conditioning  
Units for Cooling . . . Horizontal Furnaces . . .  
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Air Conditioner Heats  
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Counterflow  
Units Approved  
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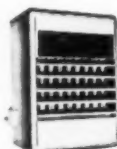
Basement Air Condition-  
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proved for Either Gas  
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Gravity Furnaces  
Approved for Oil  
or Coal, Cast Iron  
or Steel



Utility Air Condition-  
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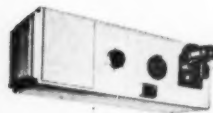
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60,000 to 170,000  
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Furnaces  
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65,000 and  
85,000 Gas  
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123,000 Oil

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS

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FURNACE PIPE AND FITTINGS



Mr. Gent emphasized that there is an abundance of zinc. He said that smelters hold 95,000 tons of stock and the price of the galvanizing grade of zinc has gone down 43 per cent since June 2, 1952. In 1952, he said, world zinc reserves were three times larger than in 1931.

About 200,000 tons of zinc are currently being used each year on galvanized sheet and strip, according to Mr. Gent. The total use of zinc in all galvanized products is running at 425,000 tons a year (this includes sheets, wire, metalware, etc.).

Mr. Gent stressed the advantages of using galvanized roofing, which can be put on an open deck roof. "Galvanized sheets add structural strength to the building, carry snow and ice loads well, and are not easily damaged," he said.

### **Design-Strengthened Sheet — Many Uses**

Contributing to the discussion of new developments in metals and metal-treating processes, Robert G. Leary, Rigidized Metals Corp., described a design-strengthened and textured stainless steel sheet. In this sheet, the metal is displaced in all directions in the flat plane by design-rolling of a three-dimensional pattern, which creates stiffness or rigidity in all directions. This type of sheet is intended to offer three main advantages: additional strength, permitting the use of lighter gages and saving weight; utility surfaces which can withstand scratches, scuffs, dents, etc.; and pre-finishing which will eliminate the need for further finishing when an installation is made.

Mr. Leary showed a chart giving information on the rigidity, buckling strength, impact strength, and tensile strength of this type of sheet. He also illustrated and described many applications, such as store fronts, shelving, coffee urns, kick plates for doors, etc.

### **Wholesaler Must "Get Out and Sell"**

Why should a wholesaler spend money on merchandising promotions and "creative selling" if he can get by without them and keep the money which would have been spent as profits? Answering this question, Roger K. Becker, Ohio Valley Hardware and Roofing Co., told the distributors that "'Plus' business does not come in without a demand for a product, and demand does not come until it is created." Therefore, he said, a wholesaler cannot go along without sales promotion programs and still expect to have profits.

Going on to define "creative selling," Mr. Becker said that the successful summer cooling salesman must paint a picture of "cool comfort." He must "sell comfort, not machinery." He also urged that the wholesaler never think of the customer market as fixed. "When a wholesaler makes a sale," he said, "he is not just competing with another wholesaler on the same item. That new home may be competing with a new Cadillac; that new air conditioning system, with a vacation in Florida."

Outlining the selling means open to the wholesaler, he first listed utilization of specialty salesmen who have only a limited number of lines or items assigned to them.

Their job should be not only to take orders but also to stimulate consumer demand and retail sales, Mr. Becker said. "A heating specialty salesman," he went on, "will devote a substantial amount of his time to working with his dealers on sales promotion, and to such allied types of service as cooperation with the NWAHACA in dealer training schools, meetings with home builders, working on home shows, etc."

Second, he listed a coordinated program of dealer shows, meetings, and events. These, he felt, are separate from the work of specialty salesmen, but are not possible without their assistance. Citing his own company as an example, Mr. Becker said that each time a new line is introduced, there is a dealer meeting and open house at which men are present to arm the dealer with material for a powerful sales presentation. Each season, a group of meetings is held with heating dealers. One session is devoted to sales, and one to engineering and service.

Mr. Becker urged that sales meetings be made as profitable as possible, pointing out that his company has worked out a system of "auditioning" manufacturers who wish to present a line to men at a meeting. The presentation is heard by a company official before the meeting begins.

### **Helping the Dealer**

N. T. Hess, Vorys Bros., expanded on the theme of the relationship between the wholesaler and the dealer. He said that it is part of the wholesaler's merchandising job to teach the dealer to conduct his business well — to be a better merchandiser. This involves, first, teaching him to be a good buyer.

Mr. Hess also feels the wholesaler can help teach the dealer about credit — when to extend it, and when not to. The dealer must understand accounting to a considerable degree, and must know how to keep complete and accurate business records so that he will know where, how and when he is making a reasonable profit.

### **Other Talks Given**

A number of other talks were given on topics of interest to the distributors. W. L. McGrath, Williamson Heater Co., presented his impressions of the International Labor Organization, to which he was a U. S. employer delegate; Robert Miner, Ohio State University, discussed wholesale distribution; Glen R. Johnson, Clark Equipment Co., covered handling equipment used in the operation of the sheet metal warehouse; J. A. Karl, International Harvester Co., described methods of determining operating costs of trucks and the steps which can be taken toward their economical operation; and Lee J. Haines, E. E. Souther Iron Co., talked on reducing office costs.

In addition, Thomas A. Fernley, Jr., executive secretary of the association, described various surveys being made by his office for the benefit of the members. One of these is a monthly tabulation of sales, inventories and accounts receivable. Another study is on wholesalers' overhead expenses. This is for use by members as a check on their operations.

# YOUR BUSINESS AND THE LAW



## When Can Dealer Be Sued for Damages?

**Albert W. Gray**

**When mechanical equipment causes a fire or explosion through malfunctioning, who is held responsible? Sometimes, the dealer — if it can be proved that the equipment was solely "under his control"**

A FIRE OCCURRED on the top floor of a dwelling early on a Christmas morning several years ago. The owner had no definite knowledge of the cause. Yet because a warm air heating plant had been installed only 21 hours before, the dealer was held by the court to have been negligent and to be liable for the damage.

This building had been originally equipped with a duct system and a vertical type of furnace placed in a first floor closet. Later, the owner arranged with this dealer to substitute a horizontal type of gas furnace with fan and motor controls. In the installation, the existing ductwork was supplemented by extending the gas supply and electric wires to the attic of the building.

The work had been begun at about 3:00 p.m. on December 22nd and completed at 11:00 p.m. The following afternoon, the installation had been checked and approved by the dealer's engineer.

The system functioned satisfactorily until the night of December 24th, when rain and freezing weather weighed down and in many instances broke the power wires and forced a temporary discontinuance of the electric service

*Albert W. Gray, author of this article, has had twenty years experience as an attorney in the courts of New York City. He has written widely on legal matters and is the author of "The Family Legal Adviser".*

of the city. At about 6:00 a.m. the attic of the building was in flames. The fire, according to one of the firemen, was centered around this recently installed heating unit.

### **The Accident "Speaks for Itself"**

A court in that state in an earlier decision summarized a principle of law relating to accidents of this character that in many instances places a heavy responsibility on warm air heating and air conditioning dealers.

"In cases where the owner cannot be expected to have any information as to the cause of the accident, whereas the dealer on the contrary must be assumed to be fully informed on the subject, and where the accident is of a kind which ordinarily does not occur when due care has been exercised, the rule is that the accident speaks for itself, that is to say, that a presumption of negligence arises from the fact itself of an accident. The accident itself makes out the case and the burden is on the dealer or contractor to show an absence of negligence."

In the lawsuit brought by this house owner against the warm air heating dealer for the damage from this fire, the court in its decision holding the dealer liable for negligence, said:

"After the installation, certain tests on two different occasions were conducted by the engineer and the dealer's employees, which tests disclosed no defects in the system. Admittedly however, the dealer did not secure an inspection together with a partial test of the gas lines which the employees extended into the attic. The fireman, on entering the attic of the house, found there burning gas being emitted from the extended gas line which was described as broken or containing a loose connection.

"Furthermore, the dealer's engineer did not test the unit with the electric service disconnected — which omission becomes seemingly important when it is remembered that the fire occurred while the electric blower was not in operation, due to the disruption of the electric service to the house. Had these last two mentioned tests been carried on, very probably the owner's house would not have been burned."

### **Must Prove Dealer Responsible**

This principle that seemingly imposes the liability for a fire or explosion of undetermined origin on a contractor or dealer has however been well restricted by the courts in its application.

Last year an appeal came before an appellate court from the decision of an action against a heating dealer for the destruction of a residence by fire, on the assertion that the contractor had negligently installed a heating furnace. The owner, warned by a passerby, had discovered the roof afire in a space about 12 ft square around the chimney.

(Please turn to page 140)

**MOST EFFICIENT DIFFUSER OF COOLED OR HEATED AIR**

**TEST PATTERNS PROVE IT!**

# TITUS *Perimeter* *Diffuser*



## **CURVED BAFFLE PLATES**

**PUT AIR WHERE IT  
IS MOST NEEDED**

Baffles direct air stream over entire wall from floor to ceiling. Give 180° diffusion. This correct diffusion eliminates floor draft. Makes house warmer because outside walls are warmer.

Engineering data on this new diffuser proves its amazing high air control efficiency. (See our new 1953 catalog which shows Iso-vel patterns CFM, & pressure requirements, smoke patterns, etc.)

This is America's MOST ADVANCED DIFFUSER. It's the FIRST all new model to outmode both design and performance of every other grille.

REQUIRES ONE-HALF THE LABOR, ONE-HALF THE DUCT WORK OF ORDINARY INSTALLATIONS. No roughing-in necessary. Makes amazing savings on every job.

For any type forced warm air heating system. Made of heavy duty 20 gauge steel.

Guaranteed quality.

**CONTRACTORS ORDER A SAMPLE DIFFUSER NOW.**

Remember not until you have a sample TITUS DIFFUSER can you show your customers its *extra attractiveness, greater diffusing efficiency, superior construction.*

Also, not until you install this DIFFUSER can you see the great amount of labor and duct work SAVINGS possible.

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**NEW 1953  
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**WATERLOO, IOWA**

Please rush me the following:

- ☐ Booklet of Trends in Warm Air Heating
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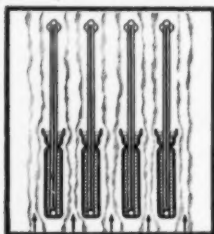
# THE CONVECTOR HUMIDIFIER

## *doesn't choke even the smallest plenum*

Compared to flat-bottom type humidifiers, Maid-O'-Mist Convector Humidifier means

- 60% less air restriction in plenum
- 30% more evaporation area
- 50% less installation time

Other advantages: 13 different sizes available, all parts non-corrosive copper or brass, pads of water absorbing materials, automatic float-operated supply valve. Get full details from your jobber or write for bulletin 701-B.



### Exclusive!

Only Maid-O'-Mist's patented individual trough design offers such maximum evaporation areas with such minimum air restriction . . . essential in short cycle modern heating. Installation time cut 50% because you just cut out plenum opening and make water connections.

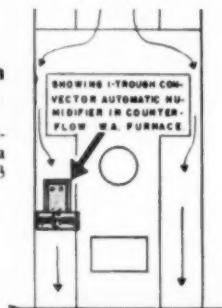


### In conventional plenum — no air restriction

Actually 60% less air restriction because usual flat bottom pan is replaced by  $\frac{3}{8}$ " vertical pans and pads.

### In counterflow system — no air restriction

Depending on furnace design, can be installed in area with air passage only 3 inches wide



**60%**  
less air restriction in plenum

**30%**  
more evaporation area

**50%**  
less installation time



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WATER LINE CONTROLS . HEATING SPECIALTIES

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## COOLING EQUIPMENT —

(Continued from page 67)

pressor power than will the air-cooled unit. The reason for this is that the water-cooled unit can usually operate at a lower condensing pressure and temperature than the air-cooled unit, simply because the water available for condenser cooling purposes is generally cooler than the air. Of course, there are other factors which can influence the choice. Air-cooled condensers need a lot of air. The air becomes warm after leaving the condenser and must be blown somewhere so as not to be objectionable. Air-cooled condensers require power for the blowers. On the other hand, a water-cooled condenser may require power for a well pump or a cooling tower. Both air- and water-cooled condensers become dirty or full of scale and must be cleaned on occasion.

A fifth choice in the selection of equipment is whether to use city or well water or a cooling tower. The problem must be solved by an economic analysis, provided, of course, there are no municipal regulations regarding the use of water and sewer facilities.

## FOUR-ZONE HEATING —

(Continued from page 70)

The main auditorium, balcony, choir loft and rectory office are heated in a similar manner. The rectory office is located in a wing offset over the furnace room.

### Advantages of the Heating System

This system will be capable of providing summer cooling with the addition of coils and compressors to the duct system, and space has been left in the furnace room for this purpose. No ductwork in the building need be altered to make this conversion to complete year 'round air conditioning.

The heating installation cost about \$13,000 which, according to estimates, was \$10,000 less than the cost of the type of system originally specified in the architect's plans, which included a boiler and convactor type air distribution.

The building has worked out so satisfactorily that four other churches and a nursing home in different parts of the state of Washington have requested similar heating. The nursing home will have all-weather

## Which Refrigerant?

A sixth choice may be faced by dealers at one time or another. Most manufacturers have settled on two refrigerants for residential use — "Freon-12" and "Freon-22." Why are both used and what should a contractor know about each? "Freon-12" came into use first and is, for that reason, used more widely than "Freon-22." Both refrigerants are equally satisfactory for air conditioning work. "Freon-22" pressures are higher than "Freon-12," but this is mainly the concern of the manufacturer. Differences can be tabulated as:

Refrigerant	Evaporating Pressure	Condensing Pressure
	Psig at 40 F	Psig at 100 F
"Freon-12" .....	36.98	116.9
"Freon-22" .....	69.02	197.9

The main point of interest to the manufacturer and also to the contractor is that "Freon-22" requires considerably less compressor displacement than does "Freon-12." This, in effect, allows the use of smaller compressors for the same cooling capacity if "Freon-22" is used instead of "Freon-12." The two refrigerants are not interchangeable in the same

system and no attempt should ever be made to substitute one refrigerant for the other without first getting the equipment manufacturer's advice.

## Packages or Separate Units?

A seventh choice that may confront the dealer is one to be made between a complete heating-cooling package and separate heating and cooling packages. This question cannot be generalized except for several comments. The combination package is more limited in that the relation of heating to cooling capacity may not always be the most suitable. With separate packages any combination of standard capacities can be had. Combination packages certainly have an appeal in appearance and ease of installation. They will probably be used most in new homes. The separate cooling unit will be used in existing homes where it can be added to the heating duct system. Some combination packages are designed so that they can be installed with or without the cooling unit. This idea appears to have merit, since a new home buyer can slip in the cooling section to his combination unit at some delayed date when he may be better able to afford it.

conditioning and electronic filtering, using the perimeter ductwork installed for heating.

## "Sold" on Warm Air

The Buren Sheet Metal Co. is one of the pioneers in its area for warm air perimeter heating. Its first warm air perimeter installation was done about five years ago, and since that time, it has installed about 100 jobs of all sizes, involving up to about 11,200 sq ft of floor space. These have been done in concrete slab, crawl space and full basement structures.

What this shop aims at is to convince architects that this type of heating can be most advantageous for schools, as air conditioning, electronic filtering, and activated carbon filtering can be included along with continuous air circulation, through the use of a bypass control system which also permits classroom zoning.

The company was established in 1938 by Charles C. Buren and J. E. Carter. At the present time, the shop has an average of 20 employees, comprising the two partners, a sales engineer, shop design engineer, three regular service men with fully equipped trucks, and 13 mechanics. The shop has a press brake and power shear, enabling it to do heavy work for other shops.

## MAKING A TRANSITION ELBOW —

(Continued from page 96)

The friction loss for the elbow is calculated by multiplying 50 ft by 0.0005, which is 0.025 in.

The static pressure must be known before a motor can be selected for any forced air or exhaust system.

The following is a step by step solution of the pattern problem:

### To Construct the Straight Side, Fig. 4:

- Draw an extended horizontal line, establish the point F, from this point measure  $1\frac{1}{2}$  in. and mark the point G. From point G measure 1 in. and mark the point H.
- With H as center and radius 1 in., draw a 90 deg arc. With H as center and radius  $2\frac{1}{2}$  in. draw a 90 deg arc. Draw the line J-K perpendicular to line F-G.
- Bisect the arc FK and establish the point L. Draw the work lines A, B, and C as shown.

### To Lay Out the Back Pattern, Fig. 5:

- Multiply the given radius by the constant 1.57. Thus,  $1.57 \times 2.5 = 3\frac{15}{16}$  in.
- Draw the horizontal line F'-K' which is  $3\frac{15}{16}$  in.; bisect the line and establish the center point L'. From points F', L', K' draw lines perpendicular to line F'-K'.
- From F', measure 1 in. and mark the point M'. From K' measure 2 in. and mark the point N'. Draw the line M'-N'. From point M' draw a line parallel to line F'-K' and mark the distance D between the point where this line crosses the perpendicular line from L' and line M'-N'.

### To Lay Out the Throat Pattern, Fig. 6:

- Multiply the given radius by the constant 1.57. Thus,  $1.57 \times 1 = 1\frac{9}{16}$  in.
- Draw the  $1\frac{9}{16}$  in. horizontal line G'-J'. From points G' and J' draw lines perpendicular to line G'-J'. Measure 1 in. from G' and 2 in. from J' and mark the points P' and R'. Draw a line connecting

the points.

- Establish the fall distance E which is the difference between line G'-P' and line J'-R', and which is 1 in.

### To Develop the Offset Side Pattern, Fig. 7:

- Draw the horizontal line M-P which is  $1\frac{1}{2}$  in.
- Draw a right angle. From Fig. 4 transfer length B to the horizontal leg. From Fig. 5 transfer fall distance D to the vertical leg. The hypotenuse BD is the true length line. With point P on Fig. 7 as center, and radius BD, draw an arc.
- Transfer length A from Fig. 4 to the horizontal leg of a right triangle and fall distance D from Fig. 5 to the vertical leg. The hypotenuse A-D is the true length line. With point M on Fig. 7 as center and radius AD cut the arc BD and mark the point S.
- With B-D as radius and point S on Fig. 7 as center, draw an arc.
- On a right triangle transfer length C from Fig. 4 to the horizontal leg and fall distance E from Fig. 6 to the vertical leg. The hypotenuse C-E is the true length line.
- With P on Fig. 7 as center and radius C-E, cut the arc BD which was made using point S as center. Mark the point R.
- With point R on Fig. 7 as center and  $1\frac{1}{2}$  in. line J-K on Fig. 4 as radius, draw an arc. With hypotenuse line AD as radius and point S on Fig. 7 as center cut the arc JK and mark the point N.
- Bisect the distance between points M and S and through the points draw an extended line. Bisect the distance between points S and N and through the point draw a line to intersect the extended line at point R<sub>A</sub>.
- With point R<sub>A</sub> as center and radius R<sub>A</sub>-P draw an arc to intersect point R. With R<sub>A</sub> as center and radius R<sub>A</sub>-M draw an arc through S to intersect point N. Draw the line R-N.
- Draw the brake lines B-D connecting points P, S, and R.  
Add allowances for Pittsburgh Lock Seams, Drive and "S" Cleat Joints, and mark the patterns for forming.

## CORROSION FILM —

(Continued from page 82)

surfaces. Galvanic action, local cell action and cathodic protection are demonstrated.

The third part deals principally with passivity and protective films. The passivation of iron by exposure to concentrated nitric acid is demonstrated by bench experiments.

Then there is a discussion of the protective effects of rusts on ordinary steels and the differences in such protection as influenced by the composition of the steel. The progress that has been made in producing more corrosion resistant alloys is illustrated by some

appropriate examples.

The film ends with illustrations of the several steps that may be taken to avoid corrosion and the advantages that may be derived from a scientific approach to the solution of corrosion problems.

In a laboratory demonstration, visibility is limited only to a few, but with the use of a camera, everyone has a front seat. In the film, developments of an experiment that normally would take several hours are speeded to less than a minute through stop motion photography.

The film itself took three years to develop.

Those interested may obtain the film for use from The International Nickel Co., Inc., Development and Research Div., 67 Wall St., New York.



### UTILITY'S NEW HORIZONTAL FORCED AIR FURNACES

Here are the ideal forced air furnaces for small home installations. They fit into an attic, under the house or any compact out-of-the-way place to save precious floor space. Easy to install and low in cost, Utility Horizontal Forced Air Furnaces meet competitive conditions on the job.

Equipped with Utility's variable speed

Dy-Rekt\* Drive Blower these units provide quiet, efficient heating operation because motor shaft and blower wheel shaft are one and the same. No pulleys or belts. Automatic controls, trouble-free operation, fewer service call-backs. For large home heating at small home cost, select Utility Horizontal Forced Air Furnaces. AGA approved.



See the complete UTILITY heating line now



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**QUALITY  
PERFORMANCE  
DEPENDABILITY  
EXPERIENCE**

**INTERNATIONAL  
ECONOMY**

INTERNATIONAL HEATER CO. UTICA, N.Y.

**Behind this name...**

When you show and sell the new International Economy line — you're really set to get plenty of heating business! From one dependable source, you can offer a model and size for every home, for every type of fuel . . .

The new Oil and Gas Counterflow Units are further examples of International Economy leadership in modern home heating. Especially designed to do a man-size heating job in pint-size space — perfect for the basementless home with perimeter heating or for duct systems installed in crawl space beneath the floor. Listed by Underwriters' Laboratories — approved by AGA . . . convertible to either oil or gas. See your International Economy distributor . . .

#### NEW ASSEMBLED

## OIL AND GAS COUNTERFLOW UNITS

**OIL MODEL OR-92E (illus.)**  
92,000 Btu Output

**GAS MODEL GR-85E (not illus.)**  
85,000 Btu Input

Also available:

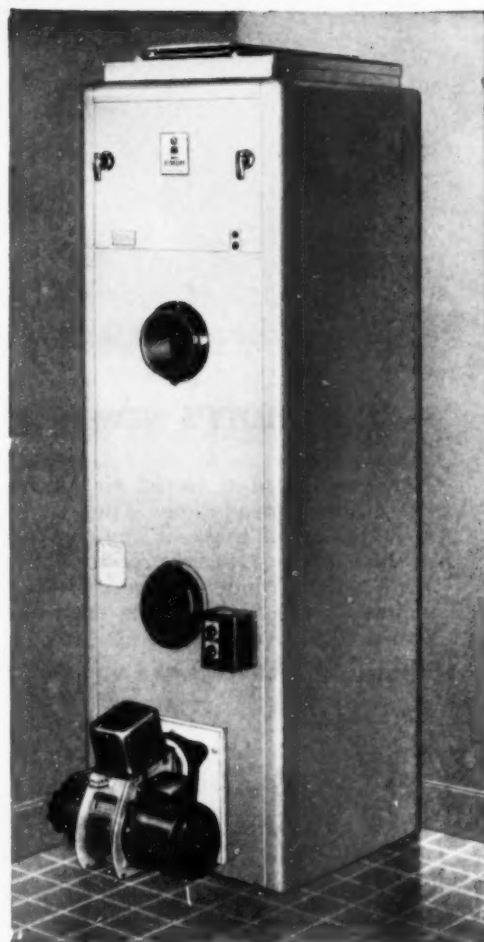
Oil Model OR-112E — 112,000 Btu Output or  
Gas Model GR-120E — 120,000 Btu Input

**10 YEAR WARRANTY**  
All International Economy furnaces carry the perfect sales - and - profit clincher . . . our 10 YEAR WARRANTY on Heating Element, Casing and Combustion Chamber — your customers' protection and assurance of satisfactory performance.

### Look at these Sales Features . . .

Completely assembled — easier installation  
Handsome heavy-gauge cabinet, rounded corners  
Combustion chamber of chrome alloy stainless steel  
Heating element of heavy-gauge steel — welded into one-piece, gas-tight unit  
Front flue outlet and inspection door easily accessible for cleaning  
Quiet, economical, pressure-type oil burner or monopoint gas burner  
10-year warranty  
Convertible to gas-firing or oil-firing  
Model GR-85E is also completely wired.

111 years of heating experience at your service . . .



See your distributor — or  
write Dept. A-7 for catalog and details:

**International  
heater co.  
utica 2, n.y.**

Western Warehouse

Chicago, Ill.





# The baby doesn't need moisture



**But you don't sell humidifiers to babies**

A baby at the "3-corner pants" age isn't interested in more moisture . . . he is likely to have an excess already.

But you don't sell humidifiers to babies anyway. It is doubtful if a baby could understand or appreciate the best features of even a superior humidifier like the Skuttle.

But home owners do. They appreciate the self-flushing, self-cleaning feature of Skuttle Series 600. They can see the value in the acid and alkali resistant porcelain enamel steel pan and float chamber . . . the blown

glass float. They can see that these will last and give service without trouble over a long period. Also they can understand the extra efficiency of patented Vapoglas Plates which take up water faster than any others.

That's why it pays to talk to the babies' fathers and mothers, grandfathers and grandmothers, uncles and aunts, friends and enemies about Skuttle Humidifiers. Homes need the extra moisture . . . owners will buy humidifiers.

*Start talking Skuttle today . . . it pays.*



## Skuttle

**MANUFACTURING COMPANY**  
4099 Beaufait Ave. • Detroit 7, Mich.

### **Note these new important features of Skuttle Humidifiers**

- 1. Porcelain Enamel Pan and Float Chamber**  
Two coats of porcelain enamel—acid and alkali resisting—on steel. Hard, dense, impervious, it's like a glass lining. Resists any water.
- 2. Blown Glass Float** Can't leak—is not

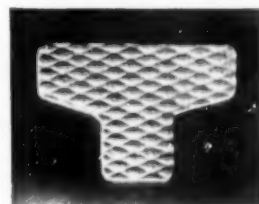
attacked by any water. More bouyant—it closes the valve better than a copper float. Interchangeable with copper float.

- 3. Aluminum Holding Rack For Plates**—light, durable, acid resistant.



### **SKUTTLE SERIES 600 HUMIDIFIER**

*Self-flushing—self-cleaning. Holds up to 20 evaporating plates. Write for bulletin on complete line of Skuttle Humidifiers—Series 300 holds up to 40 plates—Series 500 for coal fired furnaces.*



### **PATENTED VAPOGLAS PLATES**

*The most efficient plate ever made. All evaporating plates should be replaced once a year for full efficiency.*

**Write for bulletin on the Skuttle Line**



## CHEVROLET ADVANCE- DESIGN TRUCKS

**More work per dollar  
... and here are  
4 powerful reasons why!**

**MORE POWER AT LOWER COST!** Watch costs go down when you put the new heavy-duty power of Chevrolet's advanced Loadmaster engine to work! The new high-compression ratio of 7.1 to 1 in this great engine brings you more power and even greater economy than before. Chevrolet's Thriftmaster engine, too, in light- and medium-duty models offers exceptional economy of operation.

**FACTORY-MATCHED TO THE JOB!** Some jobs demand more power. Some demand stronger springs. But, *whatever* the requirements of your job, Chevrolet trucks are carefully *factory-matched* to the work to be done, with the *right* power—and the *right* units from tires to axle, springs to clutch—to handle that work at lowest cost.

**MORE RUGGED THAN EVER!** There is extra economy, too, in the exceptional stamina of Chevrolet trucks. You can expect new ruggedness and strength with heavier, more rigid frames and brawnier construction throughout. You can expect extra miles added to the life of your truck, plus a substantial reduction in the over-all cost of hauling.

**LOWEST PRICED LINE!** Chevrolet trucks are known for qualities and features matched by no other trucks. Yet, with all these advantages, the Chevrolet line lists for less than any other trucks of comparable size and specifications. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

## CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

**TWO GREAT VALVE-IN-HEAD ENGINES**—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTIPANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.





## Here's Your Payoff Pitch

# TORIDHEET'S



### "Modernization" Promotion

You can too! 1000 this season with TORIDHEET'S profit-packed promotion package built around the sales-stimulating "Modernize in '55" theme. Millions of homemakers will feel the impact of this sales-winning combination—smashing national magazine ads, sales-winning radio spots, hard-hitting newspaper features, powerful direct mail, eye-catching window and wall streamers, and brilliant wall charts.

Now's the time to join the TORIDHEET dump—the team that's going places in the automatic heating league. Chances terrifically open NOW. Write today for full information.



### The Pioneer Rotary Wall Flame Oil Burner

Toridheet units for every need . . . every budget . . .  
 Rotary Wall Flame Burners . . . Gas Burners . . . Rotary Fired  
 Boilers and Furnaces . . . Gun Fired Boilers and Furnaces  
 . . . Gas Conversion Burners and Gas Fired Furnaces

CLEVELAND  
**Toridheet**  
 AUTOMATIC HEATING

**TORIDHEET DIVISION**  
 CLEVELAND STEEL PRODUCTS CORPORATION

Affiliated Canadian Manufacturers: Conroy Mfg. Company, Ltd., Catharino St., St. Catharines, Ont.

*Let'er Blow this fall  
Windmaster's on the job*



**If you aren't already using Windmaster Draft Controls to reduce unprofitable service calls this Fall and Winter, ask your wholesaler about these important Windmaster performance advantages. Or, write direct for latest literature and prices.**

What a relief to know that Windmaster is *already* on the job working for you when October winds blow! It's the serviceman's friend for cutting down on those unprofitable service calls and "problem" installations. Here are a few of the reasons why:

**MORE RELIEF OPENING GIVES EXTRA PROTECTION** — The square vane of Windmaster gives more free area. This means better effectiveness in relieving excessive draft and greatly improved burner performance regardless of draft conditions.

**ANGULAR MOUNTED VANE FOR FASTER RESPONSES** — Here's the answer to pesky pulsating jobs. With half the distance to travel, Windmaster's 45° angular mounted vane "arrives" quicker . . . gives more steady control of draft without lag-time or nervous quiver.

**PERMANENTLY SILENT "JEWELLED MOVEMENT"** — This is the cure for many common draft control complaints and headaches. Windmaster's vane rides on silent bearings of molded DuPont nylon that outwear steel, are free from friction, immune to corrosion and unaffected by temperature extremes.

Windmaster Corporation  
P. O. Box 776 • Columbus 16, Ohio

**Windmaster**  
Draft Control

**Windmaster**  
Corporation



# You get ALL these Features when you buy PET Drills!

Reserve Power—for the extra-tough job.

Powerful, Continuous-Duty Motors—built in PET's own factory.

Dynamic-ally Balanced Arm-atures—for freedom from vibration.

Six Heavy-Duty Ball- and Needle Bearings.

Compact Design—makes hard-to-reach drilling jobs easier and faster.

Aluminum-Alloy Die Castings—for light weight, easy handling.

Forced Ventilation—for cool running.

Precision-Cut, Heat-Treated Gears—for smooth, quiet power flow.

If you want the *best* for your main-tenance or production work, take an extra look at the PET Superduty Drill shown here. Check its features! Here's a drill that's made for heavy, continuous duty...with *plus* power per pound...built to *work* right and *handle* right on the job.

Normally you might expect to pay extra for such features—in the form of "optionals" that jack up your cost. But that's not true of PET Drills! All these features are standard in the PET Superduty line...and they're available to you at a standard drill price! That's why the coupon below can save money for you. For free catalog and name of your nearest PET distributor, mail it today!

## NOW...you can get the RIGHT DRILL for YOUR job!

PET Superduty Drills are available in 54 distinct models and 3 capacities:  $\frac{1}{4}$ ",  $\frac{3}{8}$ " and  $\frac{1}{2}$ ". Your choice of pistol or saw-type grip. With such a broad line, you don't have to compromise on a

drill that's "almost" right! You can choose *exactly* the drill you need for your job. The PET Superduty line includes drills meeting U. S. Government and military specifications.



**Plus Power  
per Pound**

**PORTABLE ELECTRIC TOOLS, INC.**

320 West 83rd Street, Chicago 20, Illinois

In Canada: Portable Electric Tools, Ltd.,  
452 Birchmount Road, Toronto 13, Ontario, Canada

### MAIL COUPON FOR FULL INFORMATION

PORTABLE ELECTRIC TOOLS, INC. AA-73  
320 W. 83rd St., Chicago 20, Ill.

Gentlemen: Please send us free copy of your PET Superduty catalog, and name of nearest distributor.

Name \_\_\_\_\_ Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# WHAT ASSOCIATIONS ARE DOING

## **Michigan Bulletin Gives Overhead Data**

A RECENT BULLETIN from the Michigan Heating and Sheet Metal Association presents a table showing the overhead of a hypothetical contractor doing an annual volume of \$140,000.

Using these figures as a base, the bulletin shows that there are different overheads in different brackets of work.

"The application of a flat overhead for such and such per cent is not good practice," it states, showing that this hypothetical contractor lost \$3040 on \$42,000 of work. He would have made this much more if he had only taken \$98,000 of work and saved himself all the wear and tear of doing the extra volume, according to the bulletin.

## **Why Contractors Need Associations**

THE ROOFING and Sheet Metal Crafts Institute, New York, in its recent issue of the *Institute Ticker*, tells members why contractors need trade associations.

It is pointed out that there are a great number of small employers in the industry, and that roofing and sheet metal work offers "some of the most competitive conditions that can be imagined."

"The 3,000,000 building trade workers solve their industry problems by organizing into international and local unions, and area building trades councils," the *Ticker* states, stressing that some type of organized cooperation is therefore necessary among the thousands of employers. Cooperation is defined as "working together of two or more persons or groups for the purpose of promoting their legitimate interests."

It is pointed out that such cooperation becomes more constructive as organizing becomes more complete. It can be achieved by "first, complete and thorough organization of local general and specialty contractors, with each segment affiliated with its respective national organization; and second, all these local associations co-operating through area building trades employer councils." Employers must remember, the institute points out, that they can do things collectively which cannot be done individually.

## **California Group Tours Steel Plant**

A TRIP THROUGH THE STEEL PLANT and tin mill of the Kaiser Steel Corp., Fontana, Calif., took the place of the regular May meeting of the Institute of Gas Heating Industries, Inc. Dinner was served in the company cafeteria.

Students of the institute's sales training school recently completed the short course on selling techniques for the gas heating industry. Classes, held in Los Angeles, covered such subjects as planning the sale, where to find prospects, telephone appointments, using displays to sell, anticipating and handling objections, arranging terms, etc.



J. R. GARVEY discussed various types of residential stokers during the recent stoker conference

## **Stoker Conference in Columbus**

COAL PRODUCERS, retailers and coal researchers met on May 6 in Columbus, Ohio, to evaluate the status of coal-fired automatic residential heating equipment and to consider ways to increase coal markets through the sale of such equipment. Eighty coal producers and retailers attended the meeting sponsored jointly by Bituminous Coal Research, Inc., the American Retail Coal Association, and the Product Promotion Committee of the National Coal Association.

Producers and retailers at the meeting came from Ohio, North Carolina, Indiana, Iowa, Wisconsin, Illinois, Michigan, Virginia, Pennsylvania, Kentucky, Tennessee, and Missouri. Lennox Furnace Co. provided meeting facilities at its plant.

E. R. Kaiser, assistant director of research, and J. R. Garvey, supervising engineer, both of Bituminous Coal Research, Inc., displayed and discussed overfeed, underfeed, bin feed, and hopper types of coal burning equipment. Methods for removing ash manually and automatically were shown. In addition to commercially available units, an automatic stoker with electric ignition was shown by David Campbell, a coal retailer of Indianapolis, Ind. The electric ignition permits the fire to go out when there is no sustained heat demand. Fire is automatically rekindled when the thermostat again calls for heat.

Julian E. Tobey, president, Appalachian Coals, Inc., summarizing the meeting, urged a continuation of research and invention on residential size stokers. He said that while a number of machines now available are capable of doing a good job, there still exists an opportunity for further reduction in cost and improvement in operation through inventions not yet made. He urged additional conferences of this type, pointing to the fact that they contribute to a concerted industry sales effort.

## **Minnesota Contractors Discuss Roofing Problems**

FIRST DAY OF THE SUMMER MEETING of the Sheet Metal and Roofing Contractors Association of Minnesota was

### Coming Events

Dec. 7-9 — National Heating Wholesalers Association, Inc., Annual Convention. Conrad Hilton Hotel, Chicago. C. Stuart Rambo, Executive Secretary, 27 E. Monroe St., Chicago 3.

Feb. 4-5 — Sheet Metal and Warm Air Heating Contractors' Association of Indiana, Annual Convention. Hotel Severin, Indianapolis. Frank E. Anderson, Executive Secretary, 439 S. 17th St., Terre Haute, Ind.

Feb. 21-25 — Michigan Heating and Sheet Metal Association, Annual Convention. Pantlind Hotel, Grand Rapids. N. J. Biddle, Secretary, 3035 E. Grand Blvd., Detroit 2.

given over to a discussion of the problems of the roofing industry. C. C. Figg, secretary, National Roofing Contractors Association, conducted the morning program on the subject of why the roofing contracting business should make a profit. The afternoon session was devoted to an open forum question and answer meeting under the direction of Roy H. Dose.

### Michigan Meetings Well-Attended

FORTY-SEVEN CONTRACTORS and supply salesmen attended the May meeting of the Kalamazoo Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association held at Bass Lake. W. R. Young, president, Behler-Young Co., gave an illustrated talk covering his recent trip to Europe at the June meeting. Also shown was the Nash Motor Co. film, *Out of the North*.

### Georgia President Addresses SMCNA Convention

W. M. JONES, SR., president, Roofing and Sheet Metal Contractors Association of Georgia, speaking at the Sheet Metal Contractors National Association convention at New Orleans, touched briefly on the subjects of general business conditions, sheet metal local union contracts, and growth of the Georgia association during the past year. A survey conducted by the association's official newspaper showed, he said, that most contractors and suppliers questioned felt that business in general was "good" or "steady", though there was a trend toward slowness in collections.

### Detroit Contractors Hear Talk on Air Conditioning

SPEAKER AT THE MAY MEETING of the Detroit Warm Air Heating Association was Lorin Miller, dean of engineering, Michigan State College, whose subject was *Comparisons of Summer and Winter Air Conditioning*. He discussed temperature gradations for various types of heating and compared the air delivery and power requirements for winter and summer conditioning. Dinner guests totaled 105.

Ed Behm was master of ceremonies at the June meet-

ing, which featured a presentation by the Michigan Consolidated Gas Co. on building the Michigan-Wisconsin pipe line.



WINNER OF THE low net golf score trophy, Bob Weaver, (left) receives award from Will Pennington, chairman, Chicago Warm Air Golf Association

### Chicago Association Holds Golf Tournament

THE CHICAGO WARM AIR Golf Association held its first tournament of the season at the Midlothian Country Club, with 53 members and guests attending.

Prizewinners, in order of scores (computed by the adjusted scoring system), were announced by W. J. Pennington, chairman of the awards committee, as follows:

#### Low Net —

Bob Weaver, Grant Wilson, Inc.  
C. E. Price, American Artisan  
Arthur McLain, Jones Sheet Metal Co.

#### High Net —

C. Gruenberg, Himelblau Associates, Inc.

#### Blind Bogey —

Bert Engstrom, Warren Barr Supply Co.  
Jay Anderson, Anderson Heating Co.  
Clyde Barnes, American Artisan  
R. Svenson, Chase Products Co.  
Harry Himelblau, Himelblau Associates, Inc.  
Will Pennington, Dole Valve Co.  
Frank Schroeder, Air-Flow Heating Co.  
C. J. Meunier, Jones Sheet Metal Co.  
R. H. Blackstone, LaSalle National Bank  
George Anderson, Condensation Engineering Corp.  
Gunnar Olsenius, U.S. Steel Corp.  
Ira Anderson, Anderson Heating Co.

#### Other Prize Winners —

George Bunt, Jones Sheet Metal Co.  
Mel Knirisch, Warren Barr Supply Co.  
Reid Olson, Barney Olson Co.  
Ray Anderson, Anderson Heating Co.  
T. A. Johansen, Central West Machinery Co.  
R. Tracy, Austin Sheet Metal Co.  
Joe Butler, Auer Register Co.  
Lars Schulein, L. E. Schulein Co.  
R. Kalvog, Austin Sheet Metal Co.  
George B. Coffey, A. M. Byers Co.  
T. Bremer, Bremer Sheet Metal Co.  
D. Park, Chrysler Corp.  
Bud Hitchcock, Minneapolis-Honeywell Regulator Co.  
W. L. Aschliman, Condensation Engineering Corp.  
Wayne Limbert, Condensation Engineering Corp.  
R. C. Wasson, Condensation Engineering Corp.  
E. A. Berg, Alladen Engineering Co.

#### Non-Golfer —

Ed Greisz

# LENNOX

## Aire-Flo® AIR CONDITIONING



### LENNOX

#### All Season Aire-Flo

Electric twin refrigeration units, hermetically sealed; 3, 4½, 6-ton sizes. Five-year warranty on refrigeration units, AGA approved, in sizes ranging from 80,000 to 200,000 btu/h.

# Built for the Home

... and adaptable to ANY TYPE home

The experience gained from 58 years as specialists in residential comfort has gone into the designing and manufacture of LENNOX Air Conditioning. The result is equipment that is amazingly silent... equipment that provides continuous humidity control... equipment that is economical to operate and so quickly and easily serviced that owners enjoy *uninterrupted* service.

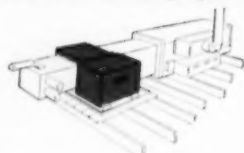
Many architects and home builders are taking advantage of Lennox All Season "pre-air conditioning." The All Season Aire-Flo System can be installed with heating equipment, only, for little more cost than a forced warm air heating system. This "pre-air conditioning" plan permits the addition of the cooling mechanism at a later date with practically no trouble or expense beyond the cost of the twin refrigeration units. All service is from the front, and only minor adjustments are needed. Builders report that this provision for future cooling makes homes much easier to sell.

Give your customers more lasting satisfaction with the revolutionary residential Lennox All Season Aire-Flo! Write for complete specifications. Installation applications engineered to your blueprints will be supplied upon request. Aggressive heating dealers will welcome this opportunity to get into the air conditioning field. Write Dept. CAA-753, The Lennox Furnace Company, Marshalltown, Iowa.

In warm air heating—MORE FAMILIES BUY

## LENNOX Aire-Flo® Heating

**LENNOX AIR CONDITIONERS FOR HOMES WITH OR WITHOUT BASEMENTS—Can be installed with any central forced warm air heating system!**



The LENNOX "Stowaway" air conditioner installed in an attic with a horizontal furnace. These units can also be adapted to "crawl-space" homes.



The LENNOX "Stowaway" air conditioner installed in a basement with a Lo-Boy furnace.



The LENNOX "Flat Top" air conditioner installed over a Hi-Boy furnace in a closet.



Here the "Flat Top" air conditioner is installed beneath a reverse flow Hi-Boy in a utility room.

LENNOX "Stowaway" and "Flat Top" cooling units are made in two sizes—2 and 3 ton, single refrigeration units, hermetically-sealed. They carry a five-year warranty on the refrigeration unit.

For specifications or installation applications engineered to your blueprints, write Dept. CAA-753, The Lennox Furnace Company, Marshalltown, Iowa.

**LENNOX FURNACE COMPANY** World's Largest Manufacturers and Engineers of Warm Air Heating Systems  
Fort Worth, Tex. • Decatur, Ga. • Pasadena, Cal. • Syracuse, N. Y. • Columbus, O. • Marshalltown, Ia. • Salt Lake City, Utah • Toronto, Ont.





Are You Swamped  
with  
**COMPLAINTS**  
about

**HOT WALLS?**  
**DISCOLORED PAINT?**  
**CHARRED WALLPAPER?**

**SOLVE** these Venting Problems  
**QUICKLY...EASILY...INEXPENSIVELY...**

with

**AMERIVENT**

"The INSULATED Gas Flue Pipe"



Gas heating contractors are only too familiar with complaints of overheated walls due to the use of heavy, un-insulated gas vents or flues. The volume of these complaints has become a matter of serious concern to the gas heating industry, as evidenced by recent AGA requirements.

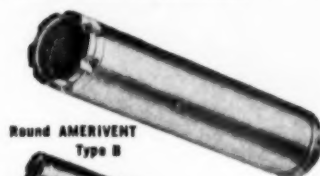
AMERIVENT double-wall, aluminum flue pipe completely eliminates hot walls, heat-damaged paint or wall-paper, and charred framing members. Its insulated construction assures cool operation, with no complaints or expensive service calls. Simply install AMERIVENT—then forget it!

*Oval AMERIVENT carries the new 'Type B-W' listing for wall-vents. It can be installed in a standard 2"x4" wall without "furring-out" or other expensive wall protection! 100% Safe!*

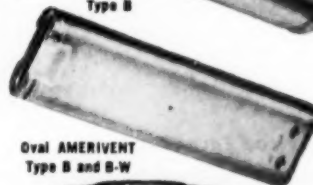
AMERIVENT is economical, too! Its patented SNAP-LOCK joint speeds installation and greatly reduces the installed cost of the vent. No cement, mastic, tools or screws needed!

FEATURED IN **LIFE** MAGAZINE. AMERIVENT flue pipe and AMERICAP vent caps were chosen by Burns Construction Co., Denver, Colorado, for use in their **TRADE SECRETS HOME** as featured in **LIFE** Magazine.

EXCERPT FROM UNDERWRITERS' LABORATORIES APPROVAL ON AMERIVENT: "It is believed that the listing of this special vent will discourage the unsafe practice of using conventional flue piping on recessed heaters."



Round AMERIVENT  
Type B



Oval AMERIVENT  
Type B and B-W



AMERICAP—the "Natural Draft" Vent Cap, Guaranteed to stop back-draft and pilot-light failure!

SOLD NATIONALLY THROUGH YOUR LOCAL SUPPLIER



**American metal products co. inc.**

2911 Compton Avenue • Los Angeles 11, California

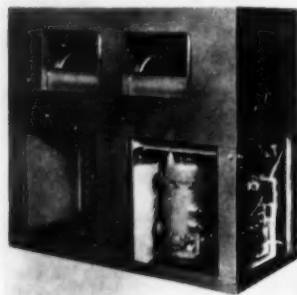
# EQUIPMENT DEVELOPMENTS

The latest information on manufacturer's developments is presented here with brief summaries of the applications of these products. For new literature giving product information which is available see page 164.

## Air-Cooled Air Conditioner

CENTRAL TYPE, air-cooled residential air conditioners which require no use of water — Airtemp Div., Chrysler Corp., 1600 Webster Ave., Dayton 1. They are especially intended for areas in which water supplies or drainage facilities are inadequate. Two types are offered: the self-contained, packaged unit for interior installation and the custom series in which the refrigerating unit is located outside the home and the cooling coil is mounted in the main furnace air discharge duct, the parts being connected by copper refrigerant tubing. Outside air is used to cool the refrigerant. Two sizes, 2 and 3 hp, are available for cooling homes of up to eight rooms. The new compressor is designed to produce more refrigeration with less weight and more compactness, the manufacturer states.

AA 1



Above: Conditioner



Right: Furnace

## Gas Fired Furnaces

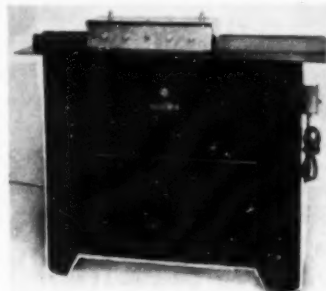
TWO NEW gas fired furnaces for houses and other small buildings — Iron Fireman Mfg. Co., 3121 W. 106th St., Cleveland 11. Both highboy and lowboy models are complete winter air conditioning units, and are approved for heating with natural, manufactured, mixed or LP gases, or with any of the LP-air mixtures. The burner uses a radiant multiple disc heat distributor. Resilient mounted blowers are permanently lubricated. Burners are interchangeable if a change of fuel seems advisable. Both furnaces are completely assembled and wired at the factory.

AA 2

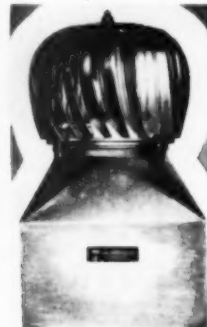
## Lock Rolling Machines

TWO NEW high speed lock rolling machines for 20 or 22 gage metal — The Flagler Corp., 19321 Filer Ave., Detroit 34. A Pittsburgh type lock can be formed on either gage stock at 50 fpm, and over 1000 drive cleats per hr can be produced, the manufacturer states. A variety of other locks, flanges and shapes can be formed

in sheet metal as well. Each model features six pairs of powered forming rolls or roll dies, gears of case hardened steel, closed end roller bearings, overload controls, and motor and drive enclosed in a cabinet base. There is more feed gage area, and material cannot creep under the feed gage, according to the company. AA 3



Above: Lock Rolling Machine



Right: Ventilator

## Motorized Ventilator

"TURBO-BASE" VENTILATOR, a complete unit incorporating a wind-driven turbine ventilator, a separate propeller fan, an adjustable shutter, and a roof base — Uno Ventilator Co., 1229 Eastern Ave., Malden, Mass. The fan is the full diameter of the ventilator throat. The ventilator is powerful enough in certain breezes to "wind-mill" the fan, if idle, the company states; electric power need not be used continually, the power fan providing standby assistance for peak ventilation needs. The ventilator is designed to avoid choking, regardless of wind direction. Mounted on the roof, it exhausts stale air from around the ceiling and discharges it above the roof line. Because the turbine head aids the fan, there is no turbulence or back-pressure, according to the manufacturer. When ventilation is not needed, the shutter seals off the unit. Throat sizes range from 9 to 24 in., peak capacity (wind plus fan) from 885 to 6000 cfm.

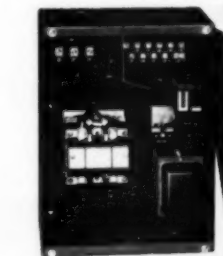
AA 4

## Heating-Cooling Control

HEATING-COOLING control panel designed to perform the necessary intermediate switching functions of residential heating-cooling units — Minneapolis-Honeywell Regulator Co., 2726 4th Ave. S., Minneapolis 8. It is designed for use with the company's heating-cooling thermostats which have built-in selector switches permitting the heating-cooling system to be controlled from one location. The new package control is also applicable for an "add-on" cooling unit in an existing heating plant. Units are offered in 2, 3, or 5 ton capacity, single phase, and up to 7½ ton capacity, three phase. The model for heating and single stage cooling is available with NEMA size 0, 1 or 1½ motor starters or contactors. It also con-

tains a fan relay, interlock relay, 24 volt transformer and a line and low voltage terminal board. Another model includes a second motor contactor for two-stage cooling.

AA 5



Above: Heating-Cooling Control

Left: Residential Year 'Round Unit

### Residential Year 'Round Units

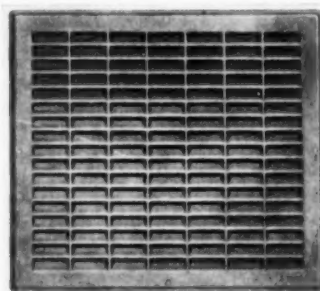
TYPE S-W small, residential year 'round air conditioning units designed for basementless homes — Typhoon Air Conditioning Co., Inc., 794 Union St., Brooklyn 15. Units take up about 5 sq ft of floor area and are rated at 2 and 3 tons of cooling capacity, with heat input ranging from 75,000 to 110,000 and output from 60,000 to 112,000 Btu per hr. Models are available for use with both gas and oil, and can be furnished for use with either water cooled or air cooled condensers. The upright and counterflow models have floor dimensions of  $28\frac{3}{8} \times 29\frac{3}{8}$  in., the former being designed for overhead air distribution and suited for installation in utility room or closets. There is automatic changeover from heating to cooling.

AA 6

### Return Air Grille

No. 333 SERIES return air grille designed for installation in ceilings, walls, or doors — Air Control Products, Inc.,

Coopersville, Mich. It is offered in a wide range of sizes. Full depth fretwork is set at a 22 deg angle to conceal



openings, retain strength, and provide adequate free area. The grille is made of heavy gage steel, with an angle frame spot-welded on to provide added strength and stiffness.

AA 7

### Baseboard Panel for Perimeter Heating

"PERIM-I-BASE" baseboard panel which utilizes standard  $3\frac{1}{4}$  in. width fittings — Thermo-Products, Inc., North Judson, Ind. It is adaptable to remodeling, especially



where solid masonry construction is encountered, as well as to new building, the manufacturer states. Heat is directed across the floor from the lower louvers, a design intended to assure warm floors.

AA 8

### Fuel Oil Filter-Valve Assembly

No. 75 FUEL OIL filter and four-way control valve assembly designed especially to connect one, two, or three storage tanks to one or more gravity type burners —

(Please turn to page 145)

This coupon is for your convenience in obtaining more information about any of the equipment mentioned in this issue. Keep your record of sources of supply up to date by adding the new products and companies listed here to your January 1953 AMERICAN ARTISAN annual directory section.

### FOR YOUR CONVENIENCE

7-53

American Artisan  
6 N. Michigan Ave., Chicago 2, Ill.

Please ask the manufacturers to send me full particulars about the equipment mentioned under the following reference numbers in Equipment Developments

(Circle each number in which you are interested)

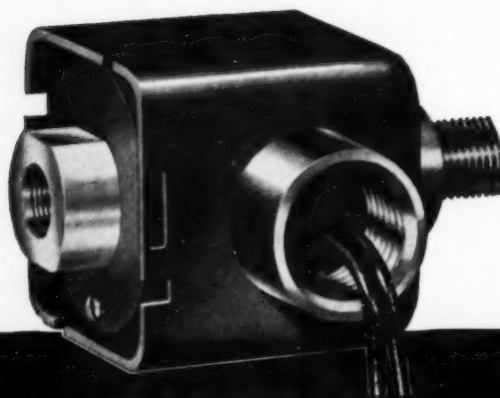
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Name ..... Title .....

Company .....

Address .....

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## The sensational new "DELAYTROL" delayed-opening valve gives cleaner starts—faster cutoff—in any position

• Here is a WEBSTER ELECTRIC "First" that is outstanding! The new "Delaytrol" delayed-opening valve puts an end to the "double trouble" of smoky starts and stops. It delays delivery of oil to nozzle 6 to 8 seconds on cold starts, allowing motor to come to full speed and establishing full draft, and assuring complete atomization and the proper amount of air for combustion.

On the shutdown, "Delaytrol" cuts off the fuel supply instantly, extinguishing the flame while the draft fan is still operating at full speed. As a result, sooting of flue passages, nozzle tips and electrodes is greatly reduced; combustion rumbles, puff-back and flutter on starts and stops are eliminated; all gases are properly exhausted, and combustion is maintained at peak efficiency for heating economy.

• **a versatile accessory:** "Delaytrol" is a complete separate unit—available as an accessory for installation in the nozzle line of any high-pressure oil-burning installation. *It operates in any position,*

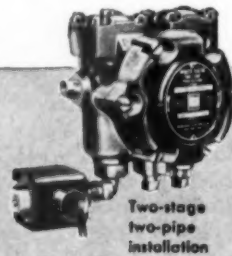
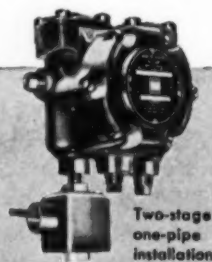
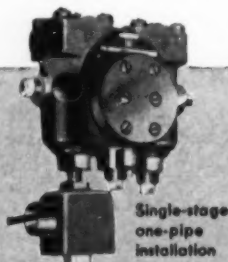
hence may be installed at the most convenient location, on existing systems. No special fittings or supports are needed, in most cases, for installation on fuel-unit or line.

• **operates in normally closed position:** "Delaytrol" operates in a normally closed position, in the nozzle line, where line pressure helps to maintain firm seating. The special design of valve and electromagnetic unit gives instantaneous, positive cutoff.

• **easy to install:** "Delaytrol's" small size and unique new "straight-through" design permit installing directly on the fuel-unit, or at any point along the nozzle line. Male inlet and female outlet fittings make installation easy.

• **"Delaytrol" is dependable:** Heavy-duty electric units combined with a special composition valve assure long and trouble-free operation from "Delaytrol"—the dependable delayed-opening valve.

*Piping Arrangements  
for the new  
"DELAYTROL"  
delayed-opening valve*

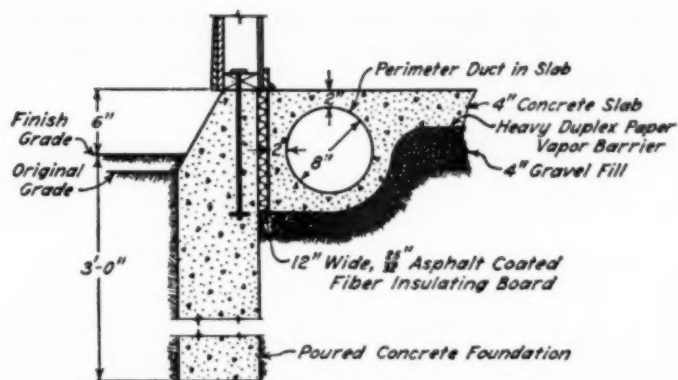


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4 THE SLAB FLOOR consisted of a 4 in. gravel fill, placed on the original grade and 4 in. of concrete

## TWO LOOP SYSTEM —

(Continued from page 63)

ture was considered to be satisfactory, since no evidence of lag or over-run of room air temperatures was obtained during periods of rapidly changing outdoor temperatures. Hence, the conventional room thermostat was considered to be satisfactory for use with the perimeter system.

Preliminary studies showed that some adjustment of the air flow rates to the various rooms was required in order to obtain uniform air temperatures. Since conventional dampers could not be conveniently installed in the duct system, the system was balanced by means of shutter dampers in the floor registers. Initially, temperatures in the bedrooms were about 3 F lower than those in the living room. When the dampers in the living room registers were practically closed, the temperature of the south bedroom was still about 1.0 F lower, and that of the north bedroom was

1.5 F to 2.0 F lower than that of the living room (for a 35 F day with a moderate wind velocity.) The fact that the bedroom air temperatures were always lower than those for the living room indicated that the limit of adjustment had been reached. This difficulty in balancing the system was attributed to the large panel heating effect from the living room floor, together with the low register temperatures in the bedrooms, as will be discussed later.

Observations of the sitting level temperatures at seven stations in the living room indicated that the east half of the room was slightly warmer than the west half. The greatest difference, which was not more than about 2 F, occurred between the east area above the parallel ducts and the cooler northwest corner of the room. This satisfactory uniformity of air temperatures was maintained with all three series of studies over the entire range of outdoor weather conditions, and compared favorably with the re-

sults obtained in Research Residence No. 2, in which the walls were fully insulated and storm sashes were used. (See University of Illinois Engineering Experiment Station Bulletin 401, *Comparative Performances of a Warm-Air Ceiling Panel System and a Convection System*, by R. W. Roose, M. E. Childs, G. H. Green, and S. Konzo.)

## Possible Improvements

Fig. 3 shows room air temperature gradients for outdoor temperatures in the range of 10 to 15 F. The temperature gradients at a given location in the room were greatly affected by the location of the heat source and the manner in which the heat was introduced into the room. For example, in Fig. 3 (a) are shown the gradients for the two bedrooms and the west half of the living room. In these areas the major heat source was the floor registers and a minor source was the warm floor above the perimeter ducts. The temperature gradients were governed largely by convection heating effects and to only a minor extent by panel heating effects. The average room air temperature differentials were from 3 to 4.5 F between the floor level and the sitting level, and were from 6 to 8.5 F between the floor level and the breathing level. The differentials for the three series were approximately the same, indicating that the location of the return-air intake did not have an appreciable effect on the differentials.

Fig. 3 (b) shows representative temperature gradients for the east half of the living room, where the heat sources were the floor registers and the warm floor above the parallel ducts. In this case, the measuring station was located directly above the parallel ducts. Temperature differentials in this area were smaller than in any other area and reflected the influence of panel heating effect from the two ducts. The average differentials from the floor level to the sitting level were from -0.5 F to 0.5 F for the three series, and from 0.5 to 2.5 F between the floor level and the breathing level.

Temperature gradients for the

TABLE 1—Experimental Conditions for Two Loop Perimeter System

Series	Air-Temp. Flow Rise, Rate		Location of Registers				Location of Return-Air Intakes			
	F	cfm	Liv. Rm.	S. BRm.	N. BRm.	Bath	Hall	Din. Area	S. BRm.	N. BRm.
P-3	100	480	Fl (W)	Fl (S)	Fl (N)	HW (NE)	Ceil. (W)	—	—	—
P-5	100	480	Fl (S)	Fl (W)	Fl (S)	Fl (N)	HW (NE)	BB (W)	—	—
P-6	100	480	Fl (W)	Fl (S)	Fl (N)	HW (NE)	—	HW (E)	HW (NW)	HW (SW)

Note: Fl = Floor Register, HW = High-wall Register, BB = Baseboard Register.  
Operating Conditions common to all series: a) Fuel Input, Btu per hr = 65,000; b) Thermostat Setting = 72 F; c) Fan Switch Settings — Cut-in = 100 F, Cut-out = 80 F; d) Limit Switch Settings — Cut-in = 185 F, Cut-out = 200 F; e) House unoccupied; f) No filters in unit.

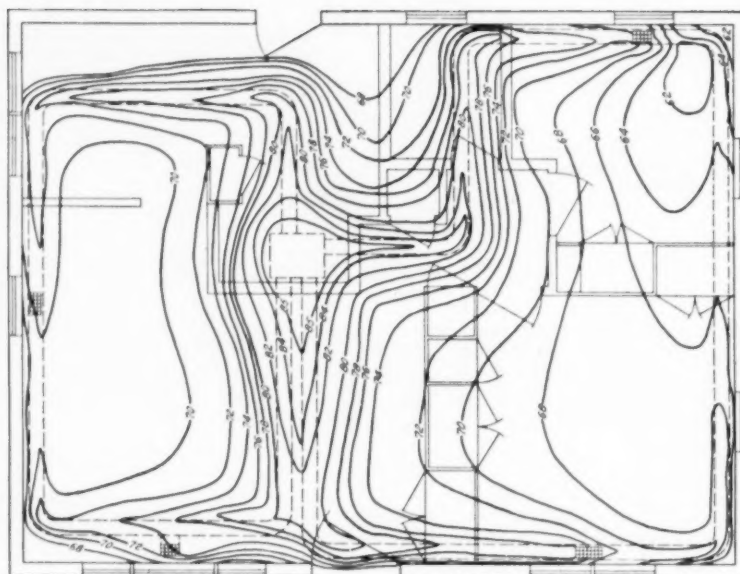
bathroom and the kitchen-utility room, both of which had unusual heat sources, are shown in Fig. 3(c). For example, the heat sources in the bathroom were the warm floor above the embedded duct and a high side-wall register. In the kitchen, the heat sources consisted of the heated floor and the heated surfaces of the furnace casing, furnace bonnet, and flue. Although the resulting temperature differentials between the floor level and the sitting level were negligibly small, large differentials existed between the sitting level and the ceiling level as a result of the stratification of warm air in the upper part of the room.

A summary of the room-air temperature differentials experienced at an outdoor temperature of about 35 F is given in Table 2. Although the temperature differentials experienced with the two loop system were not as small as had been expected, the analysis indicated that improvements could be effected by proper spacing of the feeder ducts. The performance obtained with an improved perimeter system in Residence No. 3 will be discussed in a future article.

### Floor Temperatures Vary

Satisfactory heating of any home requires that the floor surfaces be neither too cool nor too warm. The floor surface temperature charts shown in Fig. 5 are representative of conditions obtained at the end of a three day period, during which the outdoor temperature was about 40 F, cloudy weather prevailed, and the wind velocity was approximately 5 mph from the northwest. The floor surface temperatures varied somewhat with changes in outdoor temperature. For instance, as the outdoor temperature decreased, surface temperatures above the ducts increased as a result of higher duct air temperatures. However, temperatures in areas away from the ducts remained essentially constant.

A concentrated source of panel heating effect existed in that portion of the living room floor above the parallel ducts, as well as in the floors of the utility room and hall, and un-



Weather: No Sun; Outdoor Temp. 41.5°F; Wind 5 mph (SW)

5 THE FLOOR SURFACE temperature varied somewhat with changes in outdoor temperature

doubtedly contributed towards the unbalance of the system. The conclusion was reached that the ducts leading to the perimeter should be spaced far apart and under separate rooms if possible.

The floor surface temperatures near the center of the bedrooms were low even though the area was bounded by the perimeter duct. This low temperature area may be explained by the fact that the air in the perimeter duct was not maintained at a sufficiently high temperature. Most of the air flowing around the south side of the loop entered the south bedroom register, leaving only a small quantity to flow around the 30 ft length of the east loop to the north bedroom register. Hence, a considerable temperature drop was obtained in this 30 ft length, resulting not only in a low register-air temperature but also in low floor surface temperatures. The net result of the excessive temperature drop was a de-

ficiency of heat input to the north bedroom.

The evidence shown in Fig. 5 indicated that a more favorable design would consist of a continuous perimeter duct with (a) relatively short distances between the feeder ducts and the registers, (b) the feeder ducts so arranged that all sections of the perimeter duct would serve as effective air passages, and (c) relatively high air flow rates maintained in all sections of the perimeter duct.

### How Burner, Furnace Worked

The operating characteristics of the burner and blower, including such items as hours of operation, electrical input to motors, number of operations per day, and fuel input were essentially the same for the three series of studies.

With the cut-in point of the fan switch set at 100 F and the cut-out point at 80 F, the blower operated practically continuously when the

TABLE 2—Room Air Temperature Differentials for Two Loop Perimeter System, Series P-5 (Outdoor Temperature Between 30 and 40 F)

Between Floor Level and Breathing Level						
Liv. Rm., W. 4.9	Liv. Rm., E. 1.7	N. Bedroom 4.5	S. Bedroom 4.9	Kitchen-Utility 4.1	Bath 4.0	Average 4.0
Between Floor Level and Ceiling Level						
Liv. Rm., W. 5.7	Liv. Rm., E. 3.2	N. Bedroom 5.9	S. Bedroom 8.0	Kitchen-Utility 11.1	Bath 10.9	Average 7.5

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**Easily convertible with new Niagara Gas Conversion Burner.**

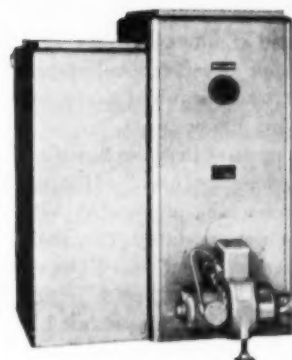
**Exclusive Niagara rectangular heat exchanger permits exceptional compactness.**

**Available with or without burner hood which accommodates either gas or oil burner.**

**Also available in Down-Flow and conventional Hi-Boy models.**

**Sizes for large, medium and small homes.**

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outdoor temperature was 50 F and lower. In order to conform with the continuous air circulation principle, the blower speed was adjusted to provide a temperature rise through the furnace unit of 100 F. In the case of Series P-5, in which the return air was drawn into the furnace at the floor level at about 70 F, the operating bonnet air temperature attained a value of 170 F after prolonged burner operation. However, in the case of Series P-3 and P-6, in which the return air intakes were located at the ceiling level, the operating bonnet air temperature attained a value of approximately 130 F after prolonged operation of the burner. From an analysis of the results it would appear that a lower bonnet air temperature and a correspondingly larger air flow rate would result in a lesser panel effect from the feeder ducts close to the furnace, a lower rate of temperature drop along the duct, and smaller room air temperature differentials. However, the

use of a temperature rise through the furnace unit substantially smaller than 100 F would result in furnace specifications which would be at variance with the existing rating requirements. The studies involving low temperature rises, therefore, were not made, particularly since the analysis also indicated that an alternative study involving a relocation of the feeder ducts seemed more promising. Such a study of a perimeter loop system with feeders located differently will be reported in one of the future articles.

### Summary and Conclusions

From these studies of a two loop perimeter system in a residence the following generalizations may be made:

- a) the room air temperature gradients and balance were not appreciably affected by the location of the return air intakes. In other words, the location of the warm air registers was far more important than the location of the returns.
- b) Relatively low room air temperature gradients were experienced except in the

TABLE 3—Summary of Performance Data for Burner and Furnace for Two-Loop Perimeter System, Series P-5 (Outdoor Temperature of 35 F)

a) Blower Operation, hr per day	25.0
b) Blower Cycles, per 24 hr	5
c) Electrical Input to Blower Motor, watt-hr per day	2450
d) Bonnet-Air Temperature, F, Av	110
e) Burner Operation, hr per day	9.0
f) Burner Operations, per 24 hr	100
g) Flue-Gas Temperature, F, Av	335
h) Fuel Consumption, cu ft of gas per day	605

case of the kitchen and bathroom, where the supply of heated air was high.

c) Warm floors were experienced. However, a concentrated source of panel heating effect existed in that portion of the living room floor above the parallel feeder ducts, contributing to an unbalance of the system. The conclusion was reached that the feeder ducts should be spaced far apart and if possible under separate rooms. Furthermore, the evidence indicated that a more favorable design would consist of a continuous perimeter duct with relatively short distances between the feeder ducts and registers, with the feeder ducts so arranged that all sections of the perimeter duct would serve as effective air passages, and with relatively high air flow rates maintained in all sections of the perimeter duct.

## Propose Trade Practice Code for Ventilating, Air Conditioning

THE SHEET METAL Contractors' National Association is publishing the second edition of *Proposed Code of Trade Practice for Ventilating and Air Conditioning*, which is designed to establish a better understanding between sheet metal men and engineers and architects designing and specifying ventilating and air conditioning installations.

The code recommends that the preparation of plans and specifications should be the work of qualified engineers and architects. It also says it is desirable to have plans and specifications prepared separately for the various trades involved in the work (except where ventilation is a minor item).

A number of items are listed as the "duties of the engineer and/or architect." It is stated that the engineer's plans, whenever practicable, with respect to equipment such as blowers, filters, etc., shall be written to establish a competitive situation. (Where a manufactured item is mentioned by name, plans should be made, where possible, for an alternate product.) Plans should definitely locate all equipment and also indicate the sizes of ducts and means for connecting such equipment. Specifications should clearly indicate the type, extent and scale of drawings to be prepared by the contractor and submitted for approval. The engineer "shall be responsible for the performance of the designed system when such system has been installed and adjusted according to plans."

In addition, various types of work and equipment are listed which "shall be incorporated in a separate venti-

lating specification." These include:

All sheet metal work of 10 gage and lighter and all materials formed into ducts, dampers, casings, etc.

Blowers and all air distributing equipment, including motors, controllers and starting equipment.

Air washers.

All types of filters and air cleaning devices.

All air handling and conditioning units and equipment including blower, coil, filter and damper sections for heating, ventilating and air conditioning.

Registers, grilles, ceiling diffusers.

Air intakes and discharges.

Soundproof lining on interior surfaces of ducts.

Insulation of ducts and other apparatus.

Flexible connections.

Sheet metal work in connection with air distribution.

Dampers for temperature control systems.

Isolation bases and platforms for ventilating apparatus.

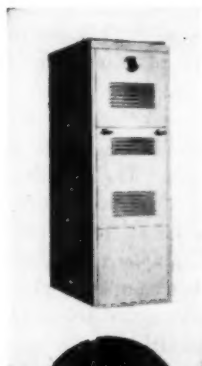
The duties of the contractor are likewise listed. It is stated that he should guarantee the installation against defective materials or workmanship for a year after acceptance of the completed installation. He "must also obtain the engineer's or architect's approval of all materials or equipment he uses, and should prepare detailed drawings for coordinating his work with that of other trades if the engineer's and/or architect's specifications call for this." All negotiations affecting costs should be conducted through the architect or engineer.

This code is intended for distribution to engineers by individual contractors and chapters and local or state associations. A mailing to engineer members of the ASHVE and individual engineers is being considered.



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## RHEEM MANUFACTURING COMPANY

World's Fastest Growing Manufacturer of Warm-Air Heating Equipment



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5 STAINLESS STEEL as used on the balcony . . .



6 AND THE ENTRANCE to the safe deposit department

## BANK WEARS STEEL —

(Continued from page 57)

recessed granite walls, it utilizes a flat expanse of plate glass doors and panels framed in stainless steel. Here, too, the marquee and sign are fabricated from stainless.

### Stainless Goes "Over the Top"

Stainless steel was carried to the top of the structure where the architects and the Monday Mfg. Co. designed a special type of coping (at right, Fig. 2). The 16 gage metal was formed to the slope of the coping and protects the full width of the parapet. Three stools are provided for each 8 ft 10 in. of section. The actual width of the brick parapet is 9 in., with the steel covering  $1\frac{3}{4}$  in. of the front surfaces and curving upward and over the top. It has a  $\frac{3}{4}$  in. rise from front to back, which returns to a  $2\frac{1}{2}$  in. depth with  $1\frac{1}{4}$  in. covering on the parapet.

A free sliding expansion joint was designed to allow for expansion and contraction in the coping. The left top plate is welded to a short  $\frac{3}{4}$  in. section between the plate and the  $1\frac{3}{4}$  in. stool, which is fastened to the parapet with a  $\frac{3}{8}$  in. expansion bolt set in mastic. The free sliding expansion joint rests between the return curve of the stool and the end of the center insert strip.

### How Columns Were Made

Another interesting piece of fabrication is seen in the 14 ft columns in the main lobby (at left, Fig. 1). The heavy 14 gage stainless encases concrete pillars in a cloverleaf pattern. Welds and screws at the joints are concealed by vertical stainless snap-in mouldings. Edges are locked under the column sheathing.

The four sections of stainless steel sheathing for each of the lobby columns were formed on a press brake, using a specially made hardwood die (Fig. 3). The die was reinforced with two light steel channels at the points of greatest stress in the bottom. Each sheathing section was formed of one 10 ft piece and one 4 ft piece, welded together after forming. The Monday Mfg. Co. developed special jigs and clamp arrangements to hold the two pieces firmly in place during welding. Sections were then ground and finished.

The basic columns are 12 in. squares of concrete over structural steel. To support the stainless steel sheathing a square angle iron frame was constructed around each column. Joints were welded. At the quarter points of the sheathing a vertical angle iron runs the entire length of the column (Fig. 4). Sheathing was installed by fastening one side of each section to a vertical angle with

screws and wrapping it around to overlap the fastened edge of the next section. Then a specially-formed trim strip was gently tapped into place with a rubber hammer to fill the seam and cover the screws.

Insulation and backing behind the stainless steel sheathing was provided by pouring a lightweight plaster-like grout into the sheathed column after assembly. This was done from above the ceiling before it was finished.

### Steel Scene on Balcony

The balcony front (Fig. 5) has a concave surface, described as being formed to a double compound curve. The concave surface was formed on a 28 ft radius. To form the top edge of the front, the stainless steel sheet was clamped to a 10 ft length of curved 4 in. pipe and hand-formed with a rubber mallet.

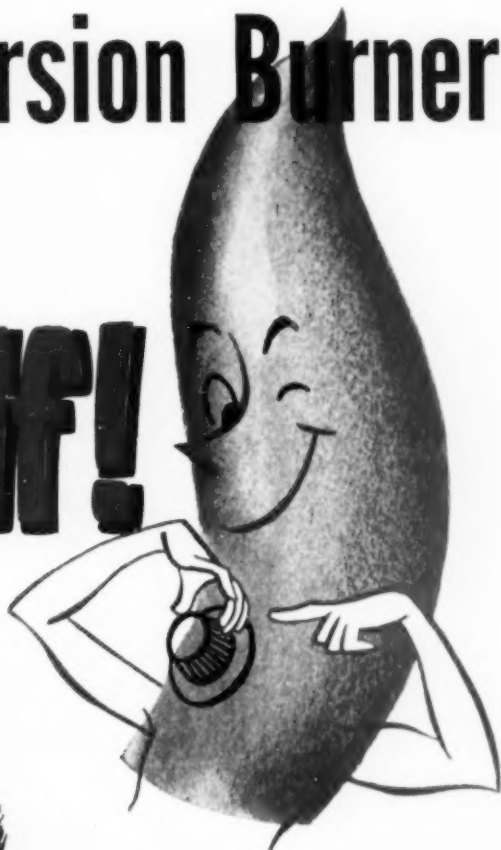
Structural iron work connects the two columns. Welded to it is a channel iron frame. The stainless steel sheathing was tack-welded to the channel iron frame before the floor above was completely poured and the ceiling below completely plastered. The safe deposit department (Fig. 6) has stainless door and window frames.

The top rail of the stairway is basically a formed mild steel bar sheathed with two stainless steel channels formed to fit (see Fig. 7). On

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with the flame that

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Here's the only gas conversion burner with flame modulation! It's the A. O. Smith Model 205 with "Magic-Heat" Control.

With it you can offer unvarying heating comfort ... no more annoying "on-and-off" cycles ... just steady heat for which every furnace and boiler was originally designed.

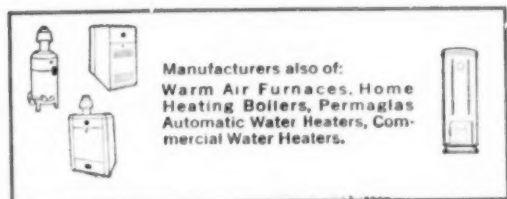
Exclusive "Magic Heat" Control senses variations in the temperature of return air in warm air systems or return water in forced-flow hot water systems. Immediately it tunes the flame to meet temperature changes.

And this gas conversion burner comes complete ... in one package. Easy to handle, stock, deliver ... and install.

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Model 205 Deluxe Gas Conversion Burner, will fit most residential installations.

Other A. O. Smith gas conversion burners include: the Model 201 with monopart type burner and the Model 350 which takes care of all your requirements up to 345,000 B.T.U. input.



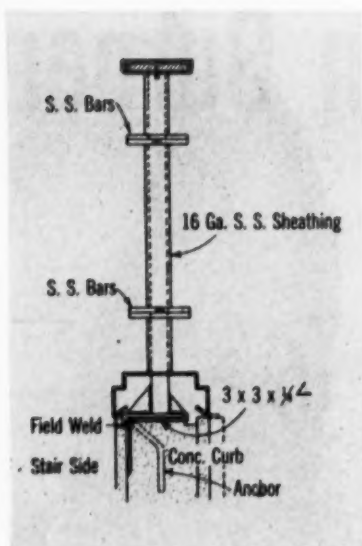
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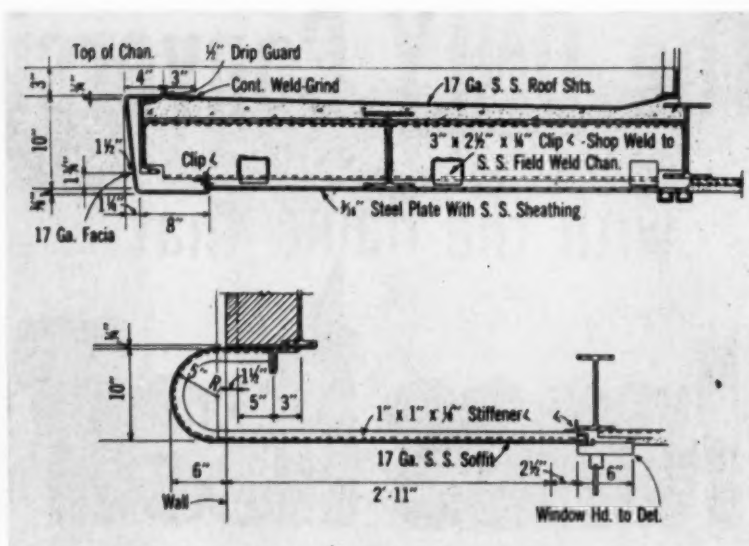
**7** HOW THE STAIRWAY railing is constructed

curved parts of the railing three pieces of stainless steel channel were required for a proper fit. The bottom stainless steel channel of the hand-rail was slipped into place and tack-welded. Then the top channel was set and lightly tack-welded. These welds were later ground down and finished. Vertical members of the stair railing are also sheathed with stainless steel. The second and third horizontal rails are solid stainless steel bar stock.

## EVAPORATIVE COOLING —

(Continued from page 61)

orative cooler will reduce the temperature of the air by at least 80 per cent of the difference between the outside dry bulb and wet bulb temperatures, which is an efficiency that is not uncommon for a well-made present day evaporative cooler. Also, assume that the cooler is sized to permit an average increase in room temperature due to sensible heat gains of not more than 5 to 7 F above the cooler discharge temperature. To determine if the design conditions given for a specific geographical location are suitable for



**8** DETAILS OF THE CANOPY (above) and the soffit (below) over the 7th St. entrance

## Sharp Corners With Type 430

Most bend points were scored with a 90 deg angle "milling cutter," designed by Monday Co., before bending. This put a 90 deg score at the line of bend about half the thickness of the sheet, enabling the worker to make very sharp square corners (Fig. 8). The valley of the notch was rounded to relieve the stress in forming Type 430 stainless steel. This made it possible to form the metal to a sharp radius with good

success. A flat-edged cutter was used on the bottom of the scored notch to allow for a greater bend radius.

The equipment used on this job included press brakes up to 12 ft in width and heavy-duty bending brakes to handle stainless steel bars for the ornamental iron work. Welding was done by the heliarc method.

[Preston M. Geren of Fort Worth was the architect and engineer for the building, with Shreve, Lamb and Harmon Associates, New York, serving in an advisory capacity. H. V. Vanderbeck was supervisory architect. T. S. Byrne, Inc., was the general contractor.]

the installation of an evaporative cooler, the temperatures in the preceding example can be used for a sample problem.

### Design Conditions:

100 F dry bulb (outside)  
74 F wet bulb (outside)  
85 F dry bulb (inside desired)  
75.3 F wet bulb (inside)  
65 per cent relative humidity (inside)  
80 per cent overall efficiency of evaporative cooler

5 to 7 F increase in room temperature due to heat leakage through walls (6 F average)

### Thus:

100 F . . . outside dry bulb  
— 74 F . . . outside wet bulb

= 26 F evaporative difference  $\times$  80 per cent = 20.8 F. 100 F less 20.8 = 79.2 + 6 = 85.2 F (within 0.2 F of the desired inside condition.)

Actual field experience has proven that evaporative coolers are effective in producing comfort with summer design wet bulb temperatures ranging as high as 70 F to 75 F, and that relief cooling may be obtained at higher wet bulb temperatures.

[Figs. 1 and 2 courtesy International Metal Products Co.; Fig. 3, courtesy Westinghouse Electric Corp.; Table 1 is from the *Code of Minimum Requirements of Comfort Air Conditioning, Transactions, The American Society of Heating and Ventilating Engineers*, Vol. 44, 1938. Fig. 4 is from the *ASHVE Heating, Ventilating, Air Conditioning Guide for 1953*.]





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BOX 28

AURORA, MO.

## 2 HP UNIT —

(Continued from page 81)

was equipped with a 10 in. wheel, was driven by a  $\frac{1}{2}$  hp motor and was integrally mounted in the cooling unit. The blower was rated to deliver 900 cfm, at standard air conditions, against a static pressure of 0.40 in. of water gage external to the unit. The return air was drawn into the unit and through the filter and the evaporator coil to the blower. The air was then forced through the furnace and into the duct system. The elements within the cooling unit were arranged in such a manner that the filter and evaporator coil were located at the return air entrance into the conditioner. This coil and the blower were in an insulated compartment and were therefore isolated from the compressor and condenser, which were located in the lower part of the unit.

The refrigeration capacity of the unit was 23,800 Btu per hr with ASRE standard inlet air conditions of 80 F dry bulb and 67 F wet bulb, at rated air delivery of 900 cfm and at 120 psi refrigerant head pressure. The semi-hermetic compressor was directly connected to the 220 volt, single phase, 2 hp motor. Both the motor and the shell-and-tube type condenser were water cooled. The refrigerant used was "Freon-12."

The duct system used in this cooling investigation was the same one used previously in heating investigations; it was of the extended plenum type, having uniformly sized trunk ducts leading from the furnace bonnet toward the east and west ends of the basement. The branch ducts were connected to the top or side of the trunks and were unchanged in size from the trunk take-off fitting to the register stackhead. All registers in the first story rooms were at the high sidewall location, 6½ ft from the floor, with the exception of the baseboard register in the front hall near the door. The accompanying floor plan shows the register locations. All return air intakes were located in the baseboard. The system was designed in accordance with

the National Warm Air Heating and Air Conditioning Association's Manual 7.

### How Measurements were Made

To measure temperatures, approximately 180 thermocouples of 24 gage copper-constantan wire were installed. Thermocouples were placed at four different levels (floor, sitting, breathing, and ceiling) on standards located near the centers of each of the first story rooms and at three stations in the basement. Thermocouples were also installed in the ceiling and floor surfaces, on the surface and within the exterior walls, in the attic, in the duct system, and at other desired points inside and outside the Residence. Each thermocouple was connected through switches to an indicating potentiometer. It was possible to obtain a continuous record of any 28 of the 180 thermocouple stations by using recording potentiometers. Resistance thermometers were installed at the sitting level on the standards in the first story rooms. These resistance thermometers were connected to a six-point recording resistance bridge which provided a continuous record of the temperatures at these selected points.

Heat-flow meters were installed in various locations in the house. The four meters which were installed in the outside walls were located on the exterior surface of the interior panels and next to the insulation. One such meter was located in each wall, 60 in. from the floor. Those which were placed above the ceiling were between the top ceiling surface and the attic insulation. One meter was also placed on the underside of both the north and south slopes of the roof.

### Studies Conducted Under Controlled Conditions

Continuous records were made of the outdoor air temperature, both dry bulb and wet bulb, the indoor relative humidity, the wind velocity, and the intensity of solar radiation received on a horizontal surface. The wind direction was noted when all observations were made.

One series of studies was con-

ducted, which provided for 120 cfm of ventilation air (one air change per hr) to be introduced mechanically into the return air side of the system. In this series the total air-flow rate through the unit was approximately 600 cfm, or 300 cfm per ton of rated capacity of the refrigeration unit. The blower was operated continuously independent of the operation of the condensing unit. The indoor dry bulb control temperature was 75 F, but no attempt was made to control the indoor relative humidity.

The house was operated with all exterior doors and windows closed at all times. The first story was also separated from the basement by a door at the top of the basement stairs. Although all windows were equipped with venetian blinds, the blinds were raised to the full open position and the windows were left completely uncovered except for the awnings and the roof overhang.

### Records Kept of a Variety of Factors

Room air, outdoor, interior and exterior wall surface temperatures, and temperatures within the wall were recorded at least twice daily — in the morning before the sun imposed a load on the house, and in the latter part of the afternoon when the peak load occurred. Power consumption, operation time, and water consumption by the unit were recorded each day at 5:30 a.m., the time selected to start the 24 hr test day.

Special studies of from 48 to 72 hours duration were made periodically. These studies were made during periods of clear hot weather and were made for the purpose of determining the time at which the maximum cooling load was imposed on the Residence, and in turn on the condensing unit, the time lag of the heat flow through the walls, and the effect of continued hot weather on the cooling load. Temperature and heat-flow meter observations were recorded hourly for approximately 18 hours each day during the special study periods.

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Why? Because the exterior walls are practically all glass — *twenty-four stories of glass*.

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The Monel Roofing Sheet used as coping covering on the parapets at Lever House took bending operations uniformly and readily. All joints, incidentally, were soldered and riveted. (See photo in circle.) Had greater strength been needed, the joints could have been welded. The skylights, as a matter of fact, *were* welded.

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### Compare Actual and Calculated Cooling Loads

Before attempting to draw any comparison of the actual and calculated cooling loads, the significant assumptions necessary to make these calculations for the Residence must be stated. As mentioned previously, the sol-air temperature method was used to calculate the heat flow through the walls and ceiling, and for July 22, the day selected, the design sol-air temperatures were adjusted for the outdoor air temperatures experienced, in accordance with the correction factors given in the ASHVE Guide. The roof-attic-ceiling combination was considered as a flat roof. The attic of the Residence was considered to be well ventilated since louvers were installed in the east and west gables and continuous openings under the eaves 2 in. wide extended along both north and south edges of the Residence. For this reason, the sol-air temperatures for the roof surface could not reasonably be applied to the attic side of the ceiling insulation. For these calculations the surface absorptivity for solar radiation was assumed to be 0.7 rather than the 0.9 value suggested in the ASHVE Guide for dark roof surfaces. In effect, this value of 0.7 lowered the sol-air temperatures that were applied at the attic side of the insulation approximately 22 per cent.

The shaded south wall of the Residence was considered to receive direct radiation from the sun for purposes of computing the wall heat gains, since there was a lack of information regarding a shaded wall. The sol-air temperatures for a north wall could be considered to apply to shaded walls; however, the differences in the values of sky radiation for the two exposures and in the times of peak temperatures indicated this would introduce an error. The error introduced by considering the south wall to be unshaded would be on the conservative side, but could become serious if the south wall contained a very small glass area. The heat gain through the walls which did not receive direct solar radiation,

such as the east wall in the north bedroom and the east wall of the living room, was considered to be a function of indoor-outdoor temperature difference only, taking into account the predicted five hour time lag.

The heat gain through the windows was computed from the tables presented in the Guide. A shading factor of 0.3 was applied to the solar heat gain for all windows equipped with awnings, and for all windows on the north and south exposures which were shaded by eave overhangs. No attempt was made to correct the heat gain through the windows for deviations of indoor-outdoor temperature difference from those on which the tables are based.

Although the calculated design cooling load of the Residence was 25,000 Btu per hr, the actual heat removed from the Residence did not exceed 22,000 Btu per hr when the outdoor design conditions were reached or exceeded. July 22, 1952, a day on which the maximum outdoor dry-bulb temperature was 95 F and the maximum outdoor wet-bulb temperature was 80 F, 4 F greater than the design wet-bulb temperature of 76 F, was used to compare the operation of the equipment against the calculated load. The cooling load for this day was calculated by using the actual outdoor conditions to adjust the design sol-air temperatures in accordance with the correction factors given in the Guide for computing the heat flow through the walls and ceiling. The heat flow through the ceiling was calculated by the method outlined in the section of the Guide on the cooling load, but by using the adjusted sol-air temperatures. The heat gain through the windows was calculated by using the same values as were used in the design calculations.

The actual heat removed from the Residence during the eighteen-hour period shown is less than the calculated heat removed would indicate. Integration of the areas under the curves of heat removed by the cooling unit shows the total to be 281,000 Btu for the 18 hour period. The predicted heat removal, obtained by

integrating the area under the calculated cooling load curve, was 326,700 Btu, 16 per cent greater than that actually removed.

### Compare Heat Storage Effects

A breakdown of the comparison into periods of the day is of more significance than comparing the total heat removal. For convenience, the test period was divided into three parts: the morning during the period when the cooling load was increasing, the period of maximum cooling load during the hottest part of the day, and the period when the cooling load was decreasing during the evening. It should also be noted that these periods coincide with the time of intermittent operation of the compressor during the morning, continuous operation during the afternoon, and intermittent operation during the evening.

Between the beginning of the study at 6:00 a.m. and the end of the last of the intermittent operations at 11:00 a.m., the unit removed 73,900 Btu from the air passing through the evaporator coil, 2700 Btu more than would be predicted from the area under the calculated curve. Although this difference is small, less than 4 per cent, it is felt that during this period there should have been an increase in the internal energy of the materials and furnishings within the residence.

This heat storage effect is shown during the period of continuous unit operation from 11:00 a.m. to 7:00 p.m. The energy removed by the unit during this long operation was 153,000 Btu, more than 32 per cent less than the value of 204,000 Btu predicted by calculation. Much of this difference can be attributed to energy entering the exterior surfaces of the Residence and being stored within the Residence, but the magnitude of heat storage is not known. That heat storage was at least partially responsible for the difference is evidenced by two factors: 1) the constant capacity of the cooling unit, and 2) the constant air temperature at the thermostat. Even though the average room-air temperature at the sitting level rose slightly more than

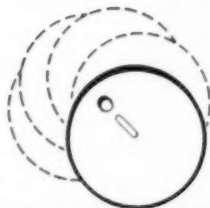


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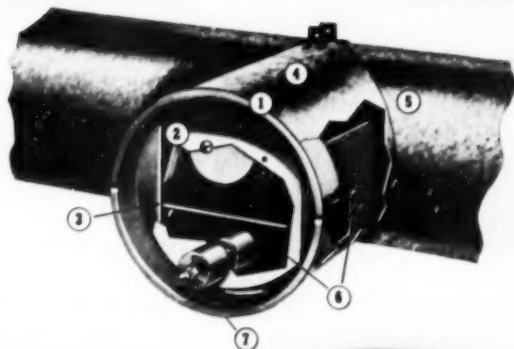


Eccentric adjustment for balancing gate in the vertical plane, second of two adjustments.



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DRAFT CONTROLS

1 F during the afternoon, the energy stored in the air within the Residence due to this temperature rise was insignificant.

The energy actually removed by the cooling unit during the evening (between 7:00 p.m. and midnight) was more than 4 per cent greater than the calculated value of 51,500 Btu. This again shows the heat storage effect of the Residence; during the period of decreasing load,

the amount of energy predicted to enter the Residence was less than the amount actually removed. The difference between the measured and the calculated cooling loads was much smaller than would be expected, since it should be during this period that the greatest reduction in heat storage would occur.

This investigation was a part of the cooperative project jointly sponsored by the Engineering Experiment

Station of the University of Illinois and the National Warm Air Heating and Air Conditioning Association.

H. T. Gilkey is Research Associate in Mechanical Engineering.

D. R. Bahnfleth is Research Assistant in Mechanical Engineering.

R. W. Roose is Research Assistant Professor of Mechanical Engineering.

*[Further results of this investigation will appear in a subsequent issue of American Artisan.]*

## CAN DEALER BE SUED? —

*(Continued from Page 108)*

The complaint of the owner was that, "The draft didn't operate as it should, soot formed in the flue and when the furnace door was opened soot would fly all over the building. The dealer had tried to fix it but it continued to smoke and soot continued to fly all over the house."

Refusing to apply this rule to these circumstances the court said:

"Negligence cannot be presumed and where the evidence is equally consistent with no negligence as it is with negligence, it is the duty of the court to decide in favor of the dealer."

### Dealer Controlling Equipment Is Liable

The courts hold otherwise however, when an extraordinary accident of this character occurs that, but for a lack of reasonable care, would not have occurred, and when the equipment is entirely within the dealer's control.

Heating apparatus installed in a house had failed to operate satisfactorily from the date of installation. At the owner's complaint the dealer had repeatedly attempted to remedy the defects until finally the owner asked him to remove the equipment and refund him the money that had been paid. The dealer asked for one last chance. Shortly afterwards fuel oil overflowed onto the furnace room floor, became ignited and the dwelling burned.

In applying the rule that "the thing speaks for itself" the court said:

"In the absence of any satisfactory explanation that the occurrence was accidental or providential or other sufficient explanation, if something unusual happens to something over which a dealer has control whereby the owner is injured and the natural inference is that the unusual occurrence is due to the dealer's act, the occurrence, being unusual, is said to speak for itself that such act was negligent.

"Although the heating apparatus was the property of the owner of the building and was situated upon the premises, as to installation and maintenance it was virtually in the control of the dealer and tended reasonably to exclude the existence of any cause of fire except one due to the improper operation of the apparatus or to negli-

gence on the part of the dealer in installing or maintaining it."

### Boundary Drawn Between Guesses and Facts

A comparison of the court decisions of two actions of this character shows the boundary beyond which the courts do not go in this assumption of negligence on the part of the contractor.

An acetylene gas tank was delivered to a plant and placed in a store room. Several weeks later a loud hissing noise was heard and fire was seen spouting from this cylinder to the wooden roof that was a mass of flame.

The decision in the action brought against the manufacturer of this acetylene tank was that since the tank had been manufactured and filled by the seller before delivery and the buyer was free of any interference with the tank, the manufacturer was responsible.

In the contrasting case, the purchaser of a gas stove from a dealer was told, "Set the thermostat and turn the gas on full, strike a match and hold it down here at the bottom of the oven."

Trouble occurred several times and in each instance the dealer was summoned to inspect the oven and each time assured the owner it was "all right."

Three months after the last call of this kind, the owner had set the thermostat, struck a match, turned the gas on full, and there was an explosion. She sued to recover damages, resting her claim on this rule that the accident speaks for itself.

The court said in its decision against her, "The mere fact that there was an explosion does not make out a case nor raise a presumption of negligence.

"Nor does the mere fact of the presence of gas in the oven raise the presumption, but something in addition to the explosion must have been shown, that is, something causing the explosion and that it occurred under circumstances where such an explosion does not ordinarily occur if proper precautions are taken and where the situation excludes everything but the negligence of the contractor.

"To say that an improper adjustment of an oven burner was the cause of the explosion would be indulging in mere speculation. Verdicts cannot be founded on this."

*[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]*

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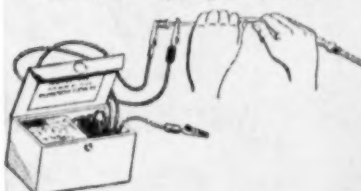
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### Thermocouple Testing with Matches

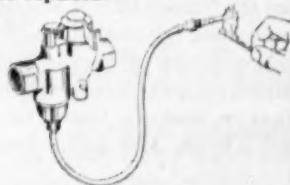
#### 1. Short Circuit Check

With thermocouple attached to a millivoltmeter, heat the hot junction with three paper matches for a period of ten to fifteen seconds. Remove matches and bend the lead slightly at various places while observing the meter dial. If the needle slowly and steadily moves toward the zero mark, there is no indication of a short circuit. If the needle drops suddenly or is erratic in its travel, a short circuit or broken inner wire is indicated and the thermocouple should be replaced. With no reading, replace the lead.



#### 2. Performance Check

Attach the thermocouple to a control that is known to be in satisfactory working order. Heat the hot junction of the thermocouple with three paper matches for a period of fifteen seconds or until you can no longer hold the matches. Reset the control immediately. If the control holds open, even momentarily, the thermocouple can be considered in good operating condition. If the control will not hold open, allow the thermocouple to cool and repeat the test. If the control will not hold open on the second test, the thermocouple can be considered inoperative and should be replaced.



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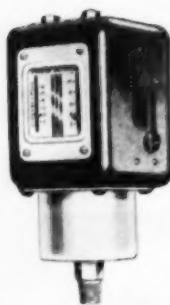
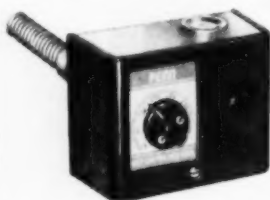
☐ Please send the name of the Baso Replacement Depot nearest me.

AA-2



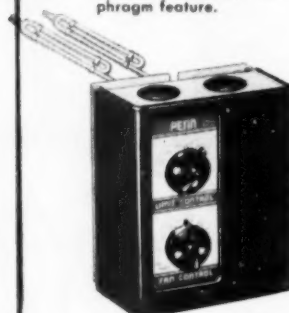
Heat-anticipating, 2-wire thermostat assures closer temperature control for real heating comfort.

Liquid expansion hot water control has "trigger-quick" response, close differential, and many other desirable features.

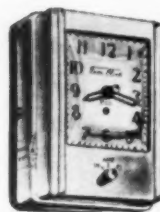
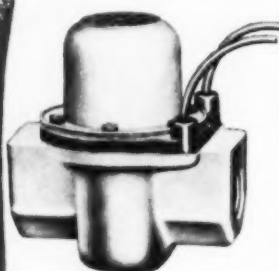


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*KEEP*  
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More and more heating dealers are discovering the effective selling job PENN controls do *after* the installation is made. *And that is very important to you!*

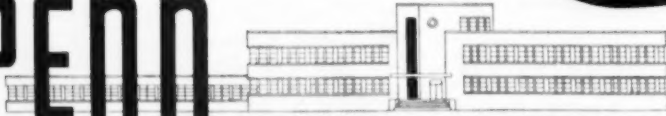
Their efficient, dependable performance eliminates HOT-n-COLD LIVING and *really delivers* the better heating comfort you sell. This results in powerful word-of-mouth advertising from better-satisfied customers. Result . . . more sales, more profit for you!

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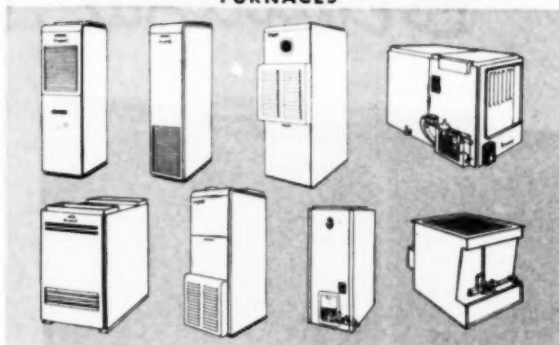


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# THE MOST COMPLETE LINE OF HOME CONDITIONING EQUIPMENT IN THE INDUSTRY

## FURNACES



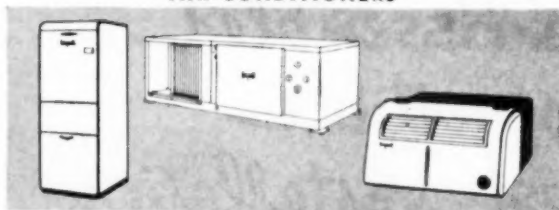
## BOILERS



## WATER HEATERS



## AIR CONDITIONERS



## SPACE HEATERS



**bryant®**

## EQUIPMENT DEVELOPMENTS —

(Continued from page 125)

General Filters, Inc. (distributor, Unifilter Co., 29845 W. 13 Mile Rd., Farmington, Mich.) It includes a water trap, a washable cartridge, and is self-venting. Fuel can be drawn from any one tank when the valve handle to any one of three built-in, threaded inlets is turned. As the desired inlet is opened, the remaining two are sealed, a measure designed to prevent loss or overflow of oil within the filter body. The entire unit is installed by screwing the externally threaded  $\frac{1}{2}$  in. main inlet into the outlet hole of the center tank. Two additional inlets can be connected with tanks at either side, or can be left plugged. A threaded outlet connecting directly to the fuel line supplies clean oil to the burner. A positive "off" position stops all fuel at the filter. The Monel wire screen cartridge is washable in a suitable solvent, requires no tools for removal or replacement. There is a built-in water trap. In this unit, air is automatically vented back into the storage tank before it can build up or impair efficiency, the manufacturer states. The unit measures  $3\frac{7}{8} \times 4\frac{1}{2}$  in. with the handle in "off" position. AA 9



Above: Filter

Right: Jig Saw



## Electric Jig Saw

PORTABLE ELECTRIC "Utility" jig saw designed to do the work of a jig saw, saber saw, keyhole saw, and to perform most band saw operations — The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Md. It can be held and guided with one hand, is supplied with five different types of blades for cutting ferrous and non-ferrous metals, rubber, insulating materials, etc. It can be mounted in an accessory table for bench work. The saw is powered by a motor for use on 115 volt, a-c or d-c current. Net weight is  $3\frac{1}{2}$  lb. AA 10

## Insulation for Ducts, Furnaces, A.C. Equipment

NEW STANDARD line of "Aerocor" insulation and sound absorbing products designed for specific markets and uses — Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1. Included among the products is flexible duct insulation, a fine fibered blanket type insulation for exposed or concealed, hot or cold air ducts; "Sonocor" lightweight sound absorbing medium for use with metal pan acoustical systems; flexible duct liner, a fiber insulation lightly coated on one side with compounded neoprene, for use as a sound absorbing material and

# Mueller Climatrol

**TYPES 116-216 Winter  
Air Conditioners**

90,000 — 116,000 — 130,000 and  
150,000 Btu input



New!  
Beautiful!



Pre-Wired  
Pre-Assembled  
Gas or Oil Convertible  
Low-Cost Installation

This attractive Mueller Climatrol Type 116-216 is designed not only to please your customers, but to help ease your installation job. It's pre-wired and pre-assembled, cuts your labor time, increases your profits. Because it's shipped in two sections, it goes down narrow, winding basement stairways without trouble.

The Type 116-216 is compact (only 45" high, 24½" wide, 61½" long); is available in four sizes — 90,000, 110,000, 130,000 and 150,000 Btu input.

Another thing! The Type 116-216 has famous Mueller Climatrol Designed Convertibility. Say your customer doesn't have gas heat, yet. But he wants the convenience and comfort of automatic heating. So he buys the unit with the oil burner installed now — converts to gas later. The conversion cost is small because Mueller planned it that way — with *Designed Convertibility*.

Go over this top-notch heating plant with your customer. Show him all the things that will please him. Corrugated-asbestos insulation, with aluminum foil backing. Heavy-gauge, welded-steel heat exchanger. Free-floating radiator, connected to drum at back only, for quiet operation. It's easy to sell because it's the best home-heating plant manufactured today!

Write for descriptive literature to the L. J. Mueller Furnace Co., 2030H W. Oklahoma Ave., Milwaukee 15, Wisconsin.



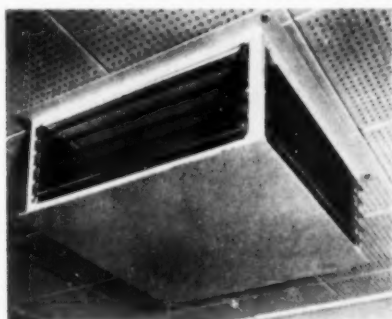
## Mueller Climatrol



thermal insulation on warm air or air conditioning ducts; furnace insulation, a thermal fibrous glass insulation faced on one side with aluminum foil secured by a high temperature adhesive; and air conditioning equipment insulation, a flexible, fibrous glass product for insulating air conditioning equipment, the basic material being neoprene-coated to prevent exfoliation or delamination at air velocities up to 600 fpm. AA 11

#### Diffuser for Evaporative Coolers

DIFFUSER FOR evaporative coolers, designed for ceiling installation in residences and commercial buildings — Ashburn Supply Co., 8468 Warner Drive, Culver City, Calif. It is designed in three models to fit duct sizes for



roof mounted evaporative coolers in all makes to 6500 cfm. Constructed of 26 gage cold rolled steel, it is provided with a cone interior bottom. The louvers are reversible for "non-vision" appearance, and there is a sliding damper panel which may be inserted during the winter to block off drafts. AA 12

#### Air Flow Regulator

REGULATOR FOR CONTROLLING air flow in heating and air conditioning systems — Wa-Trol Co., P.O. Box 6366, Houston. An indicator on the knob shows the position of the damper in the duct. Adjustment is made by pressing the knob and turning. When it is released, the spring-loaded knob locks in position. The regulator is produced in styrene plastic of various colors. AA 13



Above: Regulator

Right: Welder



#### Spot Gun Welder

SPOT GUN WELDER designed for all types of on-the-spot jobs ranging from spot welding, sheet metal work, preliminary tacking or welding of large sheet metal assemblies, etc. — Triangle Products Ltd., England (U. S. representative, C. F. Carpenter, P.O. Box 87, Allentown, Pa.) It weighs 25 lb. and requires two movements — squeezing of the toggle grip to obtain high forging pres-



*new  
improved line*

1. Graduated-Trunk and Extended-Plenum Systems
2. Small-Pipe Systems
3. Perimeter Systems

# MUELLERAIRE

FURNACE PIPE,  
DUCT AND FITTINGS

*For More Sales — More Profits*

Here's the line of Furnace Pipe, Duct and Fittings that can make your jobs *more profitable*. It's MUELLERAIRE — quality-built by Mueller Climatrol and precision engineered to ADI standards.

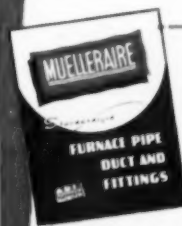
New features in the MUELLERAIRE line include snap-lock pipe, small pipe and perimeter fittings, and an exclusive stackhead for perimeter wall registers that greatly reduces roughing-in time.

There are many other good reasons why it will pay you to use MUELLERAIRE Furnace Pipe, Duct and Fittings on all your jobs. Check with your wholesaler, or write L. J. Mueller Furnace Company, 2030 W. Oklahoma Avenue, Milwaukee 13, Wis.

#### HOT OFF THE PRESS

Get your copy of the brand new, colorful 28-page Muelleraire Furnace Pipe, Duct and Fittings catalog. Available now. Use the handy coupon.

## Mueller Climatrol



L. J. MUELLER FURNACE CO.  
2030 W. Oklahoma Ave.  
Milwaukee 13, Wis.

"I'm interested in the Muelleraire line of Furnace Pipe, Duct, and Fittings. Please send me your new catalog."

Name .....  
Company .....  
Address .....  
City ..... State .....

# OHIO VALLEY

## Furnace Fittings



**Now** IS THE RIGHT TIME  
TO ORDER **FALL STOCK**

The busy fall months will bring a heavy demand for quality furnace fittings. Be ready *then* by placing your fall Ohio Valley order *now*. Ohio Valley products are made from prime-quality, full-gauge, galvanized steel—specially selected for the production of superior furnace fittings.

Write today for your copy of the new 1953 Ohio Valley Catalog. It shows list prices and describes Ohio Valley's complete line of fine furnace fittings.

*Just mail a card to:*



**Ohio Valley Hardware & Roofing Company**  
METAL MANUFACTURING DIVISION, EVANSVILLE, IND.

sure at the tips, and depression of a trigger switch to produce a spot weld. The gun will weld a maximum combined thickness of 0.16 in. with the short arms. No condenser is required. Glass insulation protects the operator. With the extension arms and clamps provided, spot welding can be produced at various angles, with reaches of from 5 to 24 in., the company states. AA 14

### Summer Air Conditioner

HORIZONTAL TYPE summer air conditioner designed to be used with forced warm air furnaces — United States Radiator Corp., 300 Buhl Bldg., Detroit 26. It can be installed in new or existing homes without structural changes of any kind, the manufacturer states. The conditioner uses the furnace blower. It is available in 2, 3, and 5 ton capacities. Cooling coils can be separated from the rest of the conditioner and installed in the existing ductwork. The rest of the unit, including the compressor, can be located at a remote spot. If desired, the complete conditioner can be installed as a single unit.

AA 15

### Automatic Dehumidifier

"ARID-ZONE" automatic dehumidifier equipped with a float-controlled shutoff switch and a red "full" warning light — Viking Air Conditioning Corp., 5601 Walworth Ave., Cleveland 2. It is also provided with connections



for a permanent drain, in which case the shutoff is protection against drain stoppage. The unit is 18 in. high, removes up to 3 gal of moisture per day from closed areas of up to 10,000 cu ft. It has a suitcase-type water drawer.

AA 16

### Sheet Metal Fasteners

SHEET METAL FASTENERS in a new variety of sizes, for holding materials such as templates, jigs, sheet metal, etc., in place during drilling, riveting, fabrication and assembly — Wedglock Co., 5416 Satsuma Ave., North Hollywood, Calif. Designed as temporary fastening, they are applied from one side of the work and can be re-used. Combined materials can be as much as 4 in. thick, the manufacturer states. Both spring actuated and hand operated wing nut type fasteners are available in various sizes.

AA 17

### Float Valve

FIG. 500 ALL-BRASS positive action float valve, available individually or in complete assemblies—Robert Mfg. Co.,



# SEQUOIA

*new model engineering  
keeps abreast of new heating trends*

WHEN architect and builder customers discuss their difficult heating jobs with a SEQUOIA dealer . . . 99 times out of 100 he has the answer right in this one advanced line. No need to carry a half dozen makes!

REV-FLO, for reverse or counter-flow, is the newest addition to SEQUOIA's family of competitively-priced, fine quality gas furnaces. Produced in the three sizes most needed for residential perimeter heat plans . . . 80, 100 and 120,000 BTU . . . *Rev-flo* is just right for concrete slab floor homes requiring floor-level heat outlets, among others.

**Write directly to the plant, or to Sequoia's nearest sales office.**

RICHMOND, VA. Jack Muther, 1504 Belleville St.  
BIRMINGHAM, ALA. W. M. Dunbar & Co., 1720 Second Ave.  
NEW ORLEANS. John A. Davis, 1016 Chappelle St.  
ST. LOUIS. J. R. Layton, 1374 Louisville Ave.  
KANSAS CITY, MO. Patterson Co., 4112 Pennsylvania Ave.  
OKLAHOMA CITY. Guy W. Gentry, Box 7131  
DALLAS. Jack B. Earp, 1023 Galloway  
PASADENA, CALIF. Glenn A. Barnes, 15 N. Oakland

A BRAND NEW furnace designed especially for perimeter heating, *Rev-flo* duplicates the unique dimensions of its widely-approved upright twin, SEQUOIA's *Close'e'er*. Wide faced and extremely shallow in depth, though of normal height, it provides every connection point right on the face for easiest installation. To space-conscious builders, these same dimensions establish *Rev-flo* as a furnace truly adapted to wall alcove or linen closet placement.

Jobbers or dealers seeking just such a progressive manufacturer to represent are invited to—

*Sales Department*

**SEQUOIA MANUFACTURING CO.**

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*Stocks maintained in Richmond, Va.; Birmingham, Ala.; and Los Angeles, Calif.*

# Only WALKER

Makes a  
Complete  
Range  
of Sizes  
of  
DRAFT REGULATORS



From Models for  
Trailers to Models for  
the Fairlington Project



● Fairlington Project at Washington, D. C., the nation's largest housing project, saves fuel with Walker Ball Bearing Type Industrial Draft Regulators. This widely heralded application is only one of thousands throughout the range of heating applications. Twelve Million sales speak for themselves...and give proof of Walker design, craftsmanship, and engineering. You can be sure that there is a Walker Fuel-Saver for your application...and that it will provide fool-proof and long-lived "performance as perfect as possible."

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Twenty pages show all types, sizes in full line. Applications and installations described. A valuable handbook FREE, if you write...



WALKER MFG. & SALES CORP.  
1730 PENN ST.  
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#### NEW WALKER VENTURI-TOP CHIMNEY CAP

is winning approval on more and more installations. Proved to be ideal in design and construction to correct insufficient draft and stop down draft...and to solve ventilating problems. Sizes from 3" to 8" ready for immediate delivery.

## Check These 9 POINTS

- 1 **EASE OF ADJUSTMENT** with exclusive patented pointer and calibrated dial.
- 2 **BOX TYPE HINGES** with sealed protection against corrosion, dirt and dust.
- 3 **BALANCE PLATE**—scientifically designed to maintain proper balance.
- 4 **SPECIFIC PIPE SIZES**—insure correct capacity for every type of installation.
- 5 **ALUMINUM FRAME**—rigid, long lasting.
- 6 **EASE OF INSTALLATION**—collar and stub for quick attachment.
- 7 **ARMCO ALUMINIZED STEEL**—for heat and corrosion resistance.
- 8 **FACTORY SET**—for "performance as perfect as possible."
- 9 **FREE FLOW** of air in unrestricted inside area.



#### EXCLUSIVE! PATENTED!

Pointer and Calibrated Dial assures quick and easy adjustment of premium quality Walker Fuel-Saver Automatic Draft Controls.

9035 Venice Blvd., Los Angeles 34. It is designed for standard duty applications on cooling towers and evaporative coolers requiring control of fluid level. Also available are discs for special services. The valves will not chatter, leak, or drip, the company states. The ratchet arrangement of the actuating lever is intended to permit quick, positive adjustment to any desired fluid level. Valves are threaded for sizes  $\frac{1}{2}$  and  $\frac{3}{4}$  in. IPS. AA 18



Above: Float Valve  
Right: Fan Control



#### Fan and Limit Control

FAN AND LIMIT control, either unit being available (without housings) for separate mounting — Cam-Stat, Inc., 11833 W. Olympic Blvd., Los Angeles 64. The low mass of the bimetal actuator assures sensitivity, and there are no creeping or changes in the settings or differentials over a long period of use, the manufacturer states. The design is compact, to facilitate integral mountings. A variety of settings and differentials, both fixed and adjustable, are offered. AA 19

#### Gas and Oil Furnaces

GAS AND OIL FURNACES designed for homes with basements — Berger Furnace Mfg. Co., 5920 Center Ave., Pittsburgh 6. Gravity and forced air models are available in both the gas and oil burning furnaces. All oil burning models are convertible to gas. Capacities range from 65,000 to 140,000 Btu. There is a long flue passage with frequent restrictions and expansions of flue gases, this being designed to assure use of all possible heat. In the return air chamber, a secondary heat exchanger pre-heats the air. Gas models are equipped with a metered flow burner which burns fuel through its three ports. Winter air conditioners have large blowers and disposable filters. A steel insulation shield prevents heat from escaping into the furnace room and traps radiant heat. AA 20

#### Industrial Welder

MODEL 99 moving coil transformer type industrial welder, a 50 per cent duty cycle welder designed for a wide range of current adjustments — Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis. It has a rated output of 250 amp at 30 arc volts, with a top usable output of 350 amp, the manufacturer states. Its two open circuit volts, on different ranges, are intended to make it flexible in all applications, with the higher open current voltage satisfactory for use of low-hydrogen electrodes. The unit utilizes air-spaced primary and secondary coils wound



# Sell the Wall Furnace ...that's Easiest to Sell

**THE BURNER MAKES THE DIFFERENCE!**

## CENTRAL HEATING AT SPACE HEATER COST

The MONOGRAM Oil Furnace is the answer to low-cost heating in small homes. The patented "Forced Air" Vaporizing Burner gives more BTU's per gallon of oil, hence is more economical, yet dual heating (see illustration) is thermostatically controlled.



## IDEAL FOR SMALL HOMES . . .

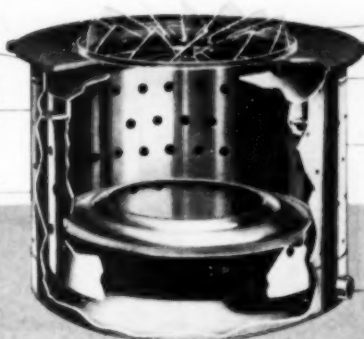
Any 4 or 5 room house may be heated comfortably with a MONOGRAM Oil Wall Furnace! Fully automatic, the heat is thermostatically controlled night and day. Thumb-nail sketch shows how dual registers provide multi-room heating.

**Monogram** MADE BY **THE QUINCY STOVE MANUFACTURING CO.**  
825 SOUTH FRONT STREET  
QUINCY . . . ILLINOIS

TESTS ON BURNER  
SHOWING MORE OF  
THE SECONDARY AIR  
IN THE FURNACE  
BURNING AND NOT  
IT WITH BURNING  
GAS AT POINT OF  
COMBUSTION

CALL AND FIND  
OUT AIR BURNING  
HERE

CALL AND FIND  
OUT AIR BURNING  
HERE



SECONDARY AIR  
DUCKS UNIFORM  
A FINE FLAME  
MORE HEAT FROM  
MORE OF HEATER

SECONDARY  
AIR INLETS TO  
COMPLETE  
COMBUSTION

PRIMARY AIR  
INLETS

FUEL VALVE

(THE VAPORIZING BURNER)

## MORE HEAT AT LESS COST

The famous MONOGRAM "Forced Air" Vaporizing Burner makes the difference! It's the design of the Burner, so advanced in engineering, that makes possible MORE BTU's for its size, delivering a wider range of operation, working just as efficient in cold as in mild weather!

# Monogram

**OIL WALL  
FURNACE**

## NO COSTLY DUCT WORK OR FLOOR SPACE REQUIRED

The MONOGRAM Oil Wall Furnace is widely adaptable ... fits into the wall (projects but 3 1/2 in. into the room) and provides DUAL heating. Can be installed in ONE day! Heated air is forced out at eye level. Furniture, even, may be placed in front of this unit. Saves space, saves owner in many ways.

## SPECIFICATIONS

BTU rating . . . 65,000  
Height from Floor of Front of Cabinet . . . 74 1/2 in.  
Height from Floor of Back of Cabinet . . . 72 in.  
Width of Front . . . 32 in.

**SEND COUPON TODAY!**

We are interested. Send complete facts and figures on MONOGRAM Oil Wall Furnaces.

NAME

COMPANY

ADDRESS

CITY

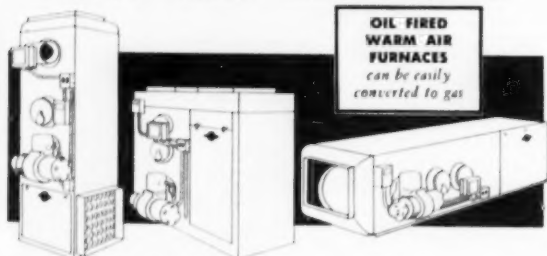
ZONE

STATE

**YOU ALSO GET THE  
BIG SIZES  
in the BESSER line!**

**A COMPLETE RANGE OF SIZES . . .**  
from 75,000 BTU to 500,000 BTU

**A COMPLETE LINE OF MODELS . . .**  
Horizontal • Vertical • Basement  
Downflo • HiBoy • LoBoy • Suspended



**Plus SPECIAL ORDER SERVICE**  
on any size unit UP TO 1,000,000 BTU

For jobs that require units larger than 500,000 B.T.U., Besser offers fast, reliable Special Order Service. We have the facilities to build any type unit required, up to 1,000,000 B.T.U. output. Every "special order" is built to the same high standards of the regular Besser line. Whatever your need, we can build it!

**And now!** A NEW PROFIT-MAKER  
JOINS THE BESSER LINE  
*Revolutionary*

**HORIZONTAL Summer  
AIR CONDITIONERS**

for Residential or Commercial installations

Combining space-saving "horizontal" design with an entirely new cooling principle, Besser Summer Air Conditioners bring central air conditioning within the reach of almost everyone. Designed for installation and operation in conjunction with central heating systems, units are fully adaptable to either warm air or hot water heating. Greatly increased efficiency lowers initial and operating costs through use of smaller units.

Available in 2, 3 and 5-Ton units.

*"Only the BEST goes into a BESSER!"*

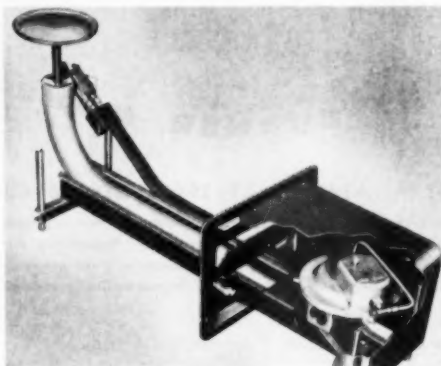
**BESSER** WARM AIR FURNACES  
Summer AIR CONDITIONERS  
*The Complete Line for Year-Round Profits*

BESSER METAL PRODUCTS CORP., P. O. BOX 4064, CHARLOTTE, N. C.

with double glass-covered insulated wire. Operation from 220 or 440 volts, 60 cycle, single phase lines is standard. AA 21

**Conversion Burner**

MODEL 208 AUTOMATIC gas-fired conversion burner for warm air furnaces — Bryant Heater Div., Affiliated Gas Equipment, Inc., 17825 St. Clair Ave., Cleveland 10. It is easy to install and adjust, and clean and quiet in



operation, the company states. Six ratings are available, ranging from 75,000 to 370,000 Btu, all AGA approved for use with all gases. Features include a stainless steel flame spreader, the "Safety Sentinel" pilot which restarts the fire after interruptions of service due to low gas pressure, an adjustable venturi and burner tube, and fully automatic controls. AA 22

**Register for Perimeter Heating**

"OUT-O-WALL" THREE-WAY diffusion register for perimeter heating — Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill. No boots are needed; head and boot are all in one piece. The three-way grille is designed for perimeter installations using small size round duct, and is available in 4, 5 and 6 in. duct sizes. AA 23

**Electrode**

MILD STEEL E-6010 electrode, "Fleetweld 51," — The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17. It is a shielded arc electrode designed for all-position d-c welding of all types of joints, producing flat faced fillets when welding in a vertical position and reducing sagging or excessive convexity on welds made in any position, the manufacturer states. It may also be used for welding galvanized, dirty, or rusty plate. The electrode is available in 14 in. lengths and in diameters of 1/8, 5/32 and 3/16 in. AA 24

**Pinch Type Rolls**

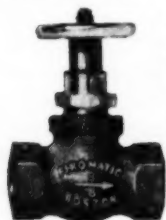
SERIES C all steel, 5 in. rolls, of the initial or pinch type — Wysong and Miles Co., 625 Fulton St., Greensboro, N.C. Frames are one-piece weldments. Rolls are machined and polished alloy forgings. Each roll is power driven and grooved to the buyer's specifications. Machine cut, steel gears run in a continuous bath of oil and automatically remain in proper mesh at any roll setting, the

# Firomatic

## PRODUCTS

**VALVES • FUEL OIL FILTERS • SAFETY DEVICES**

### FIROMATIC FUSIBLE AND NON-FUSIBLE VALVES



Illustrated is one of over 80 different types available in a line that includes Globe, Check, Lever, Anti-hum, Tank and Range Burner Valves... all made of Cast Bronze with internal working parts of Brass for long wear.



### FIROMATIC THERMAL SWITCH

Eliminates the necessity of a manually operated safety switch. Mounted in junction box on electric supply line to oil burner, the Firomatic Thermal Switch breaks the electrical circuit to burner, stopping it instantly if room temperature exceeds 165°.



### FIROMATIC FUEL OIL FILTER AND CARTRIDGE

Filter is of heavy steel construction, hot tin dipped inside and out to prevent corrosion. Bottom drain plug permits easy drainage of sludge without removing filter from line. May be used either at tank or burner. Cartridge Container is made of coated steel with louvre type openings for filtering large particles. Filtering material inside case removes all other harmful impurities.

SEND FOR NEW FULL LINE CATALOG "A"

**THE MORSE-SMITH-MORSE CO.**

165 Dexter Avenue  
Watertown, Mass.

**SOLD NATIONALLY  
BY JOBBERS ONLY**

250,000 homes are  
safer because of a

# Van-Packer

## PACKAGED MASONRY CHIMNEY

The finest homes deserve the maximum safety of Van-Packer's thick wall of insulating vermiculite concrete, tile liner, asbestos jacket and acid-proof cement — plus its tightly sealed sectional construction. Underwriters' listed for all fuels, F. H. A. and code accepted.

Do the complete installation—furnace and chimney. Takes only 3 hours or less to install Van-Packer. No service required. Makes central location of heating plant possible—shorter heat runs—greater fuel savings. No delays on the job. Immediate delivery. Everything furnished.



**VAN-PACKER CORPORATION**  
Dept. 3, • 209 S. LaSALLE STREET  
CHICAGO 4, ILLINOIS

Please send me your latest, complete circular on Van-Packer Packaged Masonry Chimney.

Name \_\_\_\_\_

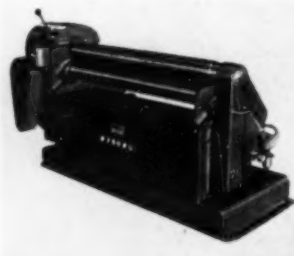
Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

Name of Firm \_\_\_\_\_

Also Manufactured and Distributed in Canada by  
C. A. McRobert and Son, Ltd., St. Laurent, Quebec.

manufacturer states. Roll setting indicator scales are mounted on both end frames. Sizes are 36 in. × 3/16 in., 48 in. × 8 gage, 60 in. × 10 gage, 72 in. × 12 gage, and 96 in. × 16 gage. AA 25



Above: Pinch Type Rolls



Right: Highboy Furnace

### Highboy and Lowboy Furnaces

REDESIGNED gas and oil fired highboy and lowboy furnaces — Airtemp Div., Chrysler Corp., 1600 Webster Ave., Dayton 1. Features include the "corduroyed" heat exchanger which is designed to provide 50 per cent more heat transfer area. Factory assembled, the units are designed with added blower capacity to handle cool as well as warm air. Controls for gas and oil models are placed in the front furnace compartment. Rapid conversion from gas to oil is facilitated by the "unitized" gas and oil burner assembly. There is a built-in draft diverter. Fourteen models are available in capacities ranging from 67,000 to 125,000 Btu. AA 26

### Frame for Diffuser

TYPE E FRAME designed to permit installation of the No. 15 sidewall diffuser in a baseboard location — Air Control Products, Inc., Coopersville, Mich. For installation, the frame is fastened to the wall with four screws, the stackhead is flanged over the frame, and the diffuser is fastened in place. The frame is of heavy gage metal. AA 27

### Summer Air Conditioner

"MAYFAIR" PACKAGED summer air conditioner for small commercial establishments, in new 2 and 3 hp models — American Radiator & Standard Sanitary Corp., P.O. Box 1226, Pittsburgh 30. Built around a hermetically sealed refrigerant circuit, it controls temperature, humidity, ventilation, cleanliness and circulation of the air. Cooling capacities are 24,000 Btu per hr for the 2 hp model, 36,000 Btu per hr for the other. Multiple units also can be installed. Either model requires 22 × 25 in. of floor space. Units may be located outside the conditioned area, in adjoining rooms or basements from which ductwork is used to convey conditioned air. The refrigeration circuit is spring-mounted, consisting of a gas cooled

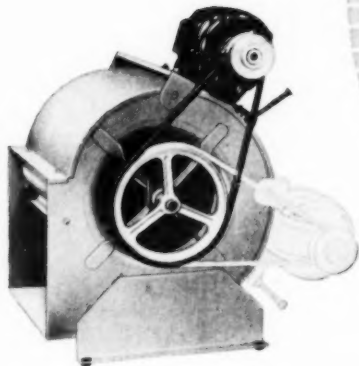




*Brundage*



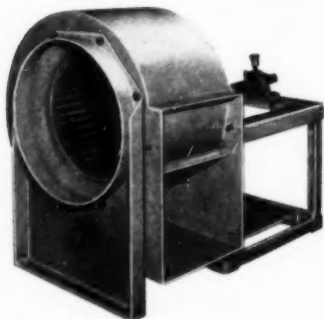
**DIRECT DRIVE BLOWER** — Can be designed into your furnace in any operating position, 65,000 BTU capacity.



**SERIES "X" BLOWER ASSEMBLIES** — 40,000 to 200,000 BTU rating. Four discharge styles... bottom horizontal, top horizontal, bottom vertical, top vertical.



**BLOWER FILTER PACKAGE UNITS** — Convert coal, oil or gas gravity furnaces to forced air. Five sizes . . . 80,000 to 225,000 BTU rating.



**BLOWER EXHAUSTER** — For industrial ventilation, smoke, heat, fume removal. Single width, single inlet. Adjustable discharge angle.

**FOR OVER 40 YEARS...**

*"Products of Character"*

**YOU CAN SELL WITH CONFIDENCE  
...WITH PRIDE...WITH PROFIT**

And you'll add to your reputation as a dealer in top-quality merchandise. For more than forty years the name *Brundage* has signified quality and character in blowers . . . comparable to that of Cadillac in automobiles. That's why you can sell Brundage with confidence and pride. Every blower bearing the name *Brundage* reflects integrity . . . in materials . . . in workmanship . . . in inspection. That's why far fewer service calls are required . . . that's why you can sell Brundage with more *real* profit.

Remember . . . more leading furnace manufacturers specify Brundage blowers than any other make . . . concrete evidence that Brundage blowers live up to their reputation of "Products of Character."

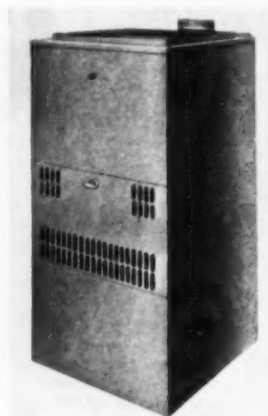
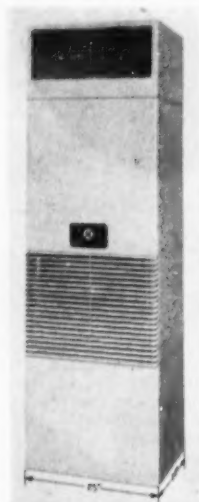
It will pay you to get complete details on Brundage air conditioning blowers . . . Products of Character You Can Sell With Confidence. Write today.

THE *Brundage* COMPANY

*Blower Specialists Since 1919*

516 NORTH PARK STREET • KALAMAZOO 11, MICHIGAN

compressor and a counterflow condenser with removable header plates. There is a high pressure cutout. Electric, water, and drain connections are necessary. Winter heating can be provided by the addition of a heating coil. AA 28



Above: Furnace

Left: Summer Conditioner

#### Gas Fired Furnaces

THREE NEW models of Series H gas fired forced air furnaces with input ratings of 75,000, 95,000 and 120,000 Btu — Coleman Co., Inc., St. Francis & 2nd St., Wichita 1. They comply with supplementary utility requirements

and may be used with small duct as well as other air handling systems. Models are AGA approved for natural, mixed, manufactured, LP and LPG-air gases. The furnaces have a single port upshot burner and centrifugal blower. Featured are leakproof joints, heavy gage steel heat extractors and steel liners. Removable panels permit access to burner, controls and blower. AA 29

#### All-Purpose Snips

ELEVEN NEW all-purpose "Proto" snips — Plomb Tool Co., 2209 Santa Fe Ave., Los Angeles 58. Included are three multiple-leverage snips (left, right and straight cut), three duckbill or circular snips (7, 10, and 12 in.), two combination pattern snips (10 and 12 in.), and three straight or regular snips (7, 10 and 12 in.). All snips cut metals, rubber, and other materials. The multiple-leverage models are for precision cutting of intricate patterns. Cutting edges of the double-beveled blades are serrated to permit cutting without slippage. AA 30

#### Fire Pots and Torches

NEW LINE of LP fire pots and torches, the fire pots being designed for service as bench or tank-type units — The Turner Brass Works, 821 Park Ave., Sycamore, Ill. Special features of the fire pots include a corrosion-resistant cast aluminum base, steel supporting posts, and a cast iron burner. There is one-hand operation of the flame control valve. Operation is at full tank pressure, no regulator being required. The tanks are available

**ALERT SERVICE MEN SAY**

**"General"**  
**FUEL OIL FILTERS**

#### ✓ AND CHECK OFF THESE ADVANTAGES

##### ☐ QUICK PROFIT

Generals are easy to sell because customers need GF's positive filtering protection.

##### ☐ EASY SERVICE

Single-bolt assembly means instant, sure servicing — no time lost through troublesome "call-backs."

##### ☐ REPEAT SALES

Seasonal cartridge changes aid in finding new filter prospects, assure lucrative, dependable earnings.

##### ☐ SUPER-FILTRATION

Finest all-wool cartridge and GF's unique filter design mean the safest filtering known!



#### ANOTHER MONEY-MAKER!

CLEAN RIGHT Soot Remover works safely, gently, quickly cleans any heating plant. Made for General Filters, Inc.



2A-700  
for average needs

2A-700  
REPLACEABLE FELT  
CARTRIDGE



1A-25  
for small stoves,  
heaters, etc.

Veteran fuel oil service men enthusiastically agree that GENERAL FUEL OIL FILTERS are the finest all-wool-cartridge filter money can buy! Easily replaceable felt cartridges not only reduce maintenance to a few simple steps but assure positive filtering which puts an end to unprofitable service "call-backs." One cartridge change covers the entire season. In addition, GF's quick, out-in-the-open installations save you time and money on every job.



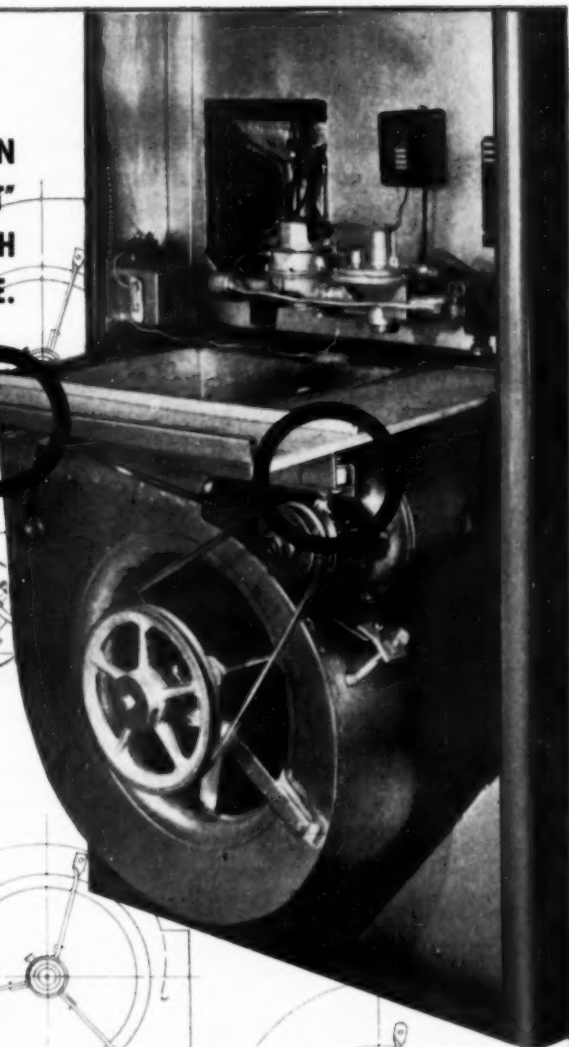
GENERAL FILTERS  
INCORPORATED

CANADIAN FACTORY BRANCH: CANADIAN GENERAL FILTERS, LTD., 2679 DANFORTH AVENUE, TORONTO 13, ONTARIO

43800 Grand River Ave.  
Novi, Mich.

# RUBBERIZING

**MAKES NOISE OR VIBRATION  
"VIRTUALLY NON-EXISTENT"  
IN THE SEQUOIA SERIES H  
QUALITY FURNACE.**



**A TWO-WAY PROFIT AND SALES  
OPPORTUNITY IN BUILDING FURNACES**

- 1 BUILD YOUR OWN BLOWER ASSEMBLIES  
AND KEEP 55% OF BLOWER DOLLAR IN  
YOUR PLANT.**
- 2 BUILD QUALITY IN YOUR FURNACE...  
ELIMINATE VIBRATION AND NOISE BY  
RUBBERIZING BLOWER INSTALLATIONS.  
WRITE MORRISON.**

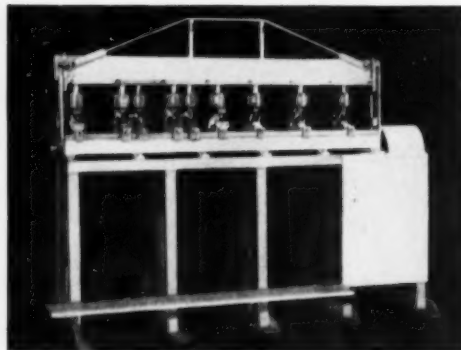
**MORRISON PRODUCTS, INC.**

**16816 WATERLOO ROAD  
CLEVELAND 10, OHIO**

# FALLSINGTON

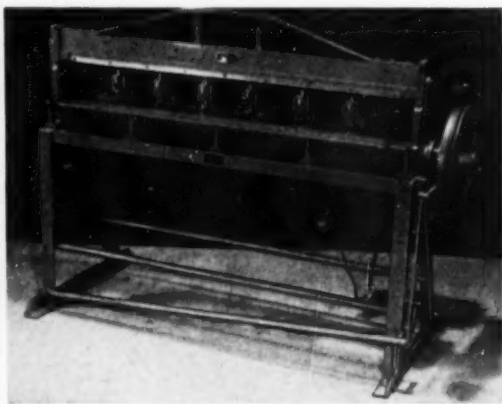
## LET FALLSINGTON SOLVE YOUR NOTCHING AND PUNCHING PROBLEMS

We can solve your notching and punching problems with two great machines — the Fallsington "C" Multi-Punching Machine and the A & B Multi-Notcher.



Above the Fallsington "C" Multi-Punching Machine is suitable for aluminum window rail and all types of multiple punching and notching. Dies are movable for entire length of machine and are self contained.

Length of machine, 3 to 6 feet.



Above — the famous Fallsington Multi-Notcher — Power driven. Made in four sizes to accommodate sheets from 18" to 48" in width — ideal for making fittings for duct work, etc.

We also manufacture—Rolling machines—Beaders & crimpers—Pipe Lock Bumping machines—and a line of hand tools—clip punch—drive cleat notchers and omni shears.

**FALLSINGTON MANUFACTURING CO.**  
FALLSINGTON, PA.

Manufacturers  
SHEET METAL MACHINERY & TOOLS

in 20 and 11 lb sizes, and have a full-curved foot ring. The new torch is offered with three interchangeable all-brass burners — needle-point, medium, and large. No pressure regulators are required. Orifice blocks are removable, and flame adjustment is by one-hand valve control.

AA 31



Above: Dehumidifier  
Left: Fire Pot

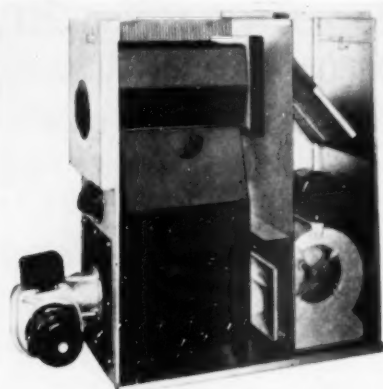
### Portable Room Dehumidifier

MODEL D750A portable electric room dehumidifier — Fresh-Aire Co., Div. of Cory Corp., 221 N. La Salle St., Chicago 1. This improved model has an on-off toggle switch located at the top of the cabinet. The removable "In-A-Drawer" container which catches the water is now larger and has a gripper-edge on the emptying slot. The unit measures 17¼ in. high, 11¼ in. wide, 18½ in. long, and weighs 52 lb. It is designed to control moisture in areas up to 10,000 cu ft. and to remove up to 3 gal per day. The ¼ hp condensing unit draws 200 watts. A 115 volt, 50 or 60 cycle a-c current is used.

AA 32

### Oil Fired Furnace

MODEL OL-75 oil fired lowboy furnace — Mayflower Air-Conditioners, Inc., E. 7th at Duluth Ave., St. Paul 6. It is factory assembled and partially wired. Assembled dimensions are 21½ × 40 × 48 in. The unit is

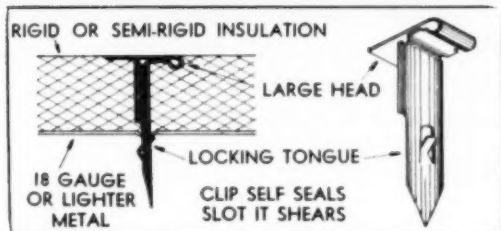
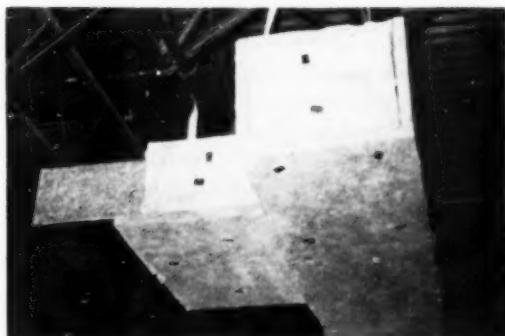


designed for small and medium sized homes, and is available for oil in a 75,000 Btu output. The combustion chamber is enclosed in a steel tray to permit pre-assembly of firebrick and mounting of the burner, after which the assembly is installed.

AA 33



# FASTEN DUCT INSULATION WITH LEXSUCO INSULATION CLIPS



**LEXSUCO  
INCORPORATED**

**4815 LEXINGTON AVENUE  
CLEVELAND 3, OHIO**

ENGINEERED PRODUCTS FOR THE CONSTRUCTION INDUSTRY

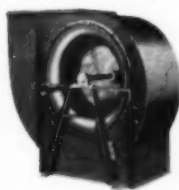
## NO FINER LINE-UP FOR PLANT CLEAN-UP



**ELECTRONIC AIR CLEANING—**  
New Westinghouse PRECIPITRON®  
Oil Mist Control unit efficiently col-  
lects coolant mists generated during  
machining operations. Send for Cat-  
alog TC-1400.

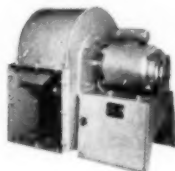


**INDUSTRIAL FANS**—An efficient new General Purpose Fan, requiring  
smaller motors, is available on short delivery. Three wheel types for  
fumes, gases, metallic dusts, chips, shavings, or long stringy materials.  
Four arrangements for integral or separate motor drive, belt or direct-  
connected. Send for Catalog 1150.



**CAST IRON VOLUME FANS**—  
Sturdy fans designed for severe  
industrial exhausting applica-  
tions or furnishing air blast.  
Noted for trouble-free low-cost  
service under toughest condi-  
tions. Send for Catalog 1130.

For data on the full Westinghouse line, ask for General Catalog  
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**UTILITY SETS**—Low-cost V-belt  
and direct driver models avail-  
able from stock. Sturdy, quiet  
centrifugal fans, easy to install  
for air supply, ventilation and  
fume exhaust. Send for Catalog  
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Westinghouse Electric Corporation  
Sturtevant Division  
Hyde Park, Boston 36, Massachusetts

Please send me a free copy of General Catalog 600.

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Help yourself to a hefty package  
of profits with

# STEWART-WARNER PACKAGED HEATING!

*Easy to handle! Simple to install!*

**Models for every need! Low in cost!**

For one room or an entire building, here's heating equipment that's "packaged" for profits—compact, streamlined, easy to handle, easy to sell! In Stewart-Warner's complete "packaged heating" line, you've got the efficient, smartly styled, low-cost answer for every heating requirement. Write today for the full story. Stewart-Warner Corporation, U. S. Machine Division, Dept. B-73, Lebanon, Indiana. (P.S.—Ask, too, about dealerships still open in some areas.)

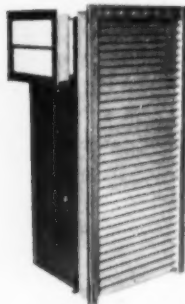
## STEWART-WARNER "Safety-Sealed" Gas Heaters

Here's safe, clean, trouble-free heat for one room or a dozen—new building or remodeling jobs—and auxiliary heating. No chimneys, ductwork or electricity! Gas is burned in a patented, sealed chamber—all combustion products are vented outside. Only outside air used for combustion. These space saving units speed installation, cut labor and material costs. Can be installed on any floor level. Individual thermostat control.

Model 8201—14,000 BTU/hr. input; 18½" x 25" x 5".

Model 8202—20,000 BTU/hr. input; 18½" x 37" x 5".

Model 8203—30,000 BTU/hr. input; 18½" x 48" x 6¼".



## STEWART-WARNER Gas and Oil Fired Wall Furnaces

Automatic centralized heating the low-cost way! Provide an abundance of gently circulated warm air plus radiant heat for warmer floors. Thermostatic control. Continuous fan operation. Easy to change from one fuel to another. Fit snugly into a closet or alcove. All controls accessible at front. Handsomely styled and finished.

Model SFO-70—Oil fired; 52,600 BTU/hr. input; 20¼" x 24" x 53¼".

Model SFG-70—70,000 BTU/hr. input with natural, manufactured and mixed gases, 64,000 BTU with LP gases; 20¼" x 24" x 50¾".

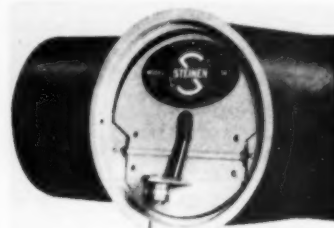
Approved by American Gas Association • Listed by Underwriters' Laboratories

**STEWART** *Safety Sealed* **WARNER**  
**GAS HOME HEATING**

Stewart-Warner Corp. • U. S. Machine Division • Lebanon, Indiana

## Smokeypipe Draft Regulators

SMOKEYPIPE DRAFT regulators for domestic installations — Wm. Steinen Mfg. Co., 43 Bruen St., Newark 5, N. J. The calibrated adjustment is designed to provide close control of draft, and to enable a service man to set the regulator in a short time for any draft. When this adjustment is made, both weights move simultaneously. There is provision in the regulator itself for attaching a short plumb line, no longer than one and one-half times the smokepipe diameter, by which the regulator may be



leveled both vertically and horizontally, and the connecting collar leveled in its relation to the smokepipe. This leveling operation requires a short cord and small washer or nut for a weight. Free swinging, edge bearing hinges are fastened to the vane and rotate on steel bearing pins. Corrosion-resistant surface treatment is given to the entire assembly. The regulator is available in two sizes to accommodate smokepipes from 5 to 10 in. in diameter.

AA 34

## Rubber Sealer for Gutters

EC-1202 FABRIC-REINFORCED black synthetic rubber sealer in ribbon form, designed as a weatherproof, watertight seal for rain gutters and other gasketing applications, including prefabricated metal buildings, air conditioning and ventilating installations, etc. — The Adhesives and Coatings Div., Minnesota Mining and Mfg. Co., 423 Piquette Ave., Detroit 2. The ribbon is applied by being pressed on one surface before riveting, screwing, or bolting of the second surface to the first. The ribbon adheres on vertical or overhead surfaces during assembly operations, and can be stripped off and re-applied, if needed. The cloth reinforcement is intended to keep the sealer from stretching or sagging during application. The sealer is available in seven widths ranging from ¼ to 2 in., and in thicknesses of 1/32 and 1/16 in.

AA 35

## Corrosion Inhibitor for Oil Tanks

"SONITOR" CRYSTALLINE substance designed to inhibit corrosion and subsequent leakage in oil tanks used for residential heating — Shell Oil Co., 50 W. 50th St., New York 19. It is poured directly into the tank. Settling to the bottom, it mixes with the water created by moisture condensing from the humid air breathed in through the vent. The solution works to stop the electric current that attacks the metal, as well as reacting with the metal to form a protective coating. The inhibitor is not soluble in oil, cannot mix with the fuel and be carried away through the outlet pipe. An application once every three years is sufficient, the company states.

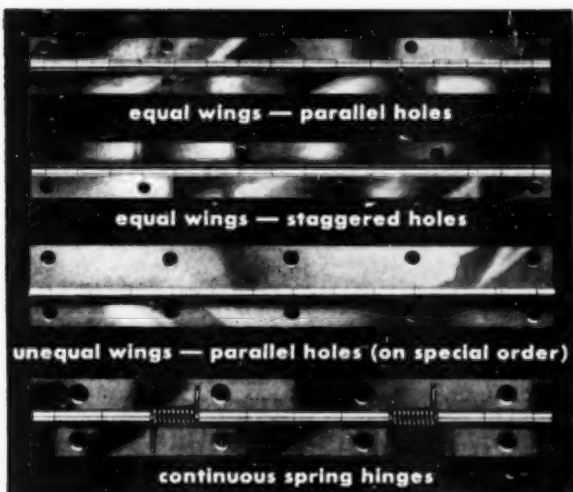
AA 36

# NATIONAL LOCK HARDWARE

for Metal Applications  
for use by manufacturers of  
Humidifiers • Oil Burners  
Air Conditioning Equipment  
Gas Heating Units • Stokers  
Space Heating Units

## continuous hinges

equal and unequal wings . . .  $\frac{3}{4}$ " to  $3\frac{1}{2}$ " widths . . .  
up to 72" lengths . . . with and without holes . . .  
available in steel, brass, monel metal, aluminum



## Sems and Keps



Thread-Cutting  
SEMS



KEPS  
Pre-Assembled Nut  
and Lock Washer

## other items



Handles, Pulls, Catches,  
Stove Bolts, Sheet Metal Screws  
write for complete information  
Buy "all from 1 source"



**NATIONAL LOCK COMPANY**  
Rockford, Illinois

# RANDALL PILLOW BLOCKS



*Control  
Lubrication*

Controlled lubrication to all parts of the bearing surface is assured by an exclusive Randall feature. Porous graphite feed plugs extend through the wall of the bronze bearing and by capillary action feed oil from the "deep well" reservoir to the graphited grooves of the bearing. These grooves distribute the oil to all parts of the bearing surface. Heat increases the capillary action of the graphite thus increasing flow of oil and assuring proper lubrication at elevated temperatures. When heat subsides, flow of oil is automatically reduced.

Randall pillow blocks have a reputation for extremely quiet operation, extra long life and trouble-free operation. Completely self-aligning, most styles can be mounted in horizontal, vertical or inverted positions and are available for light, normal or heavy duty on shafts from  $\frac{1}{2}$ " to  $3\frac{1}{8}$ " inclusive. Remember, there's a Randall that's right for every type application.

For more detailed information write for catalog No. 109 today or send your specifications.

BRONZE BAR STOCK  
BRONZE BUSHINGS  
PILLOW BLOCKS  
SHEET LUBRICATOR



GRAPHITED BEARINGS  
THRUST WASHERS  
SAFETY COLLARS  
BRONZE CASTING

**RANDALL GRAPHITE BEARINGS, INC.**

1000 S. GREENLAWN AVE., LIMA, OHIO

## EQUIPMENT BRIEFS

**STANDARDIZED METAL COMPARTMENTS** for converting pickup trucks into "mobile shops" for roofers and sheet metal, heating and air conditioning men — J. H. Holan Corp., 4100 W. 150th St., Cleveland 11. Tools, parts and small equipment can be stored in the compartments, which can be locked and are weatherproof and dustproof. Removable trays with adjustable partitions are provided. Lengths available are 72, 84, and 105 in. All compartments are 12 in. wide, 14 in. high.

**"TWINDOWELD"** ALL-GLASS, double-glazed insulating window, the edges of which are electrically fused to provide a glass-to-glass seal having no metals, bonding materials, or other assembled parts in its construction — Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22. It is designed for residential glazing, apartments, schools and other buildings where large quantities of relatively small size insulating units may be used. It is offered in sizes up to 50 x 60 in.

**MODEL 153 OIL SPACE HEATER** — Evans Products Co., Plymouth, Mich. Warm air is blown through an aperture at the bottom of the heater. Output is 50,600 Btu with a 10 in. burner.

**GLASS-LINED WATER HEATER** designed to resist heat and thermal shock and to withstand chemical and corrosive action — Day & Night Div., Affiliated Gas Equipment,

Inc., 800 Royal Oaks Drive, Monrovia, Calif. Available in 20, 30, and 40 gal sizes, it is AGA approved for operation with LP, natural, mixed, or manufactured gases. The center flue location is intended to simplify replacement.

**DESIGN CHANGE** in "Blo-Fan" electric exhaust ventilators, the outlet for the motor connection now being placed just inside the plaster ground and flush with the edge, instead of inside the housing — Pryne and Co., Inc., 110 N. Towne Ave., P.O. Box 698, Pomona, Calif. This change is intended to make replacement of the motor assembly simpler, since the receptacle can be seen more easily.

**PERSONALIZED RUBBER DOOR MAT** showing dealer's name, address, and a slogan — Mitchell Rubber Co., 2122 San Fernando Blvd., Los Angeles 65. The dimensions are 24 x 33 in.

**"S-X ALUMA-FLUX** fluxing compound designed for non-corrosive soldering of aluminum — Essex Wire Corp. (distributor, Insulation and Wires, Inc., 3435 Chouteau Ave., St. Louis 3.) It may also be used to join aluminum to other metals. Manual, dip, or mechanical means are applicable, and the compound is available in powdered or molten form. Other applications include soldering of stainless steel, carbon steel, cast iron, and all other ferrous metals, copper, brass and nickel.

## preferred by thousands . . . . .

The Thermo-Base system of baseboard warm air heating is preferred by thousands of architects, contractors and heating engineers.

Sound design, careful engineering and quality materials are fast making Thermo-Base America's favorite. Cash in on this popularity by quoting Thermo-Base on every job.

*Thermo-Base*

**WARM AIR  
BASEBOARD  
HEATING**

### GENTLE WARMTH FROM CEILING TO FLOOR

Installed around the outside walls, Thermo-Base Units eliminate drafts, hot spots and frigid fringes — giving equal distribution of humidified and filtered air.

### FREEDOM FOR FURNITURE ARRANGING

Thermo-Base gives every inch of space the same "gentle warmth" . . . there are no blasts of heat or uncomfortable cold drafts to interfere with the arrangement of furniture. Draperies and walls stay clean longer.

### IDEAL FOR AIR CONDITIONING

The gentle distribution of cool air through Thermo-Base makes it the perfect system for summer cooling.

THE  
LEADING JOBBERS  
IN YOUR TERRITORY  
WILL BE HAPPY TO  
PROVIDE COMPLETE  
DETAILS — OR  
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**THERMO-BASE Division, Gerwin Industries, Inc., Michigan City, Indiana**



"Most Valuable"



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SALES

**Sundstrand**  
All Electric  
OIL BURNER

Such integral values as design, construction and performance give the Sundstrand line selling power backed by consumer acceptance.

The public hears about Sundstrand. They see Sundstrand. They buy Sundstrand.

**Because:** Ultimate heating satisfaction means having an oil burner with

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- ★ COMPACT DESIGN
- ★ OVERALL ECONOMY
- ★ QUIET OPERATION

These salient features result from 32 years of engineering and development by Sundstrand. Available is a complete line of oil burners for new installations or conversion. To increase *your* sales with Sundstrand,

write to —

**SUNDSTRAND ENGINEERING CO.**  
ROCKFORD, ILLINOIS

## TEAM 'EM UP FOR MORE SALES!



Thousands of  
Satisfied Users  
Everywhere

Thousands  
of Prospects  
Around You

Sell Him A  
**Majestic**  
INDOOR INCINERATOR  
When He Buys  
A New Furnace

### Also Make Your Checkup Call A Dividend Call

Tell Mrs. Housewife about the *Majestic Indoor Incinerator* the next time you make a furnace check-up call — or better yet, when you install that new furnace! Here is your *best* opportunity to cash in on an *extra sale* easily, simply, quickly! She will be delighted with this home convenience because it ends, once and for all, the nuisance and danger of trash and garbage disposal. There, right in her basement she can dispose of *all* burnable refuse — even wet and dry garbage. No longer those unpleasant trips to the backyard trash burner or garbage can on cold or rainy days. All she does is fill the unit — light it and leave it! Unique downdraft feature dries the waste, then burns everything! Unit connects to furnace flue. All metal, compact and neatly designed. Available in the fuelless model illustrated or in automatic gas fired A.G.A. approved models. One to suit every pocketbook!

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COMPANY, INC.  
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7-53

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Be sure to circle the items which you wish.

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City ..... Zone ..... State .....

Mail to AMERICAN ARTISAN, 6. N. Michigan Ave.,  
Chicago 2, Ill.

### Forced Air Heating

TECHNICAL and sales literature describing upflow and downflow forced air furnaces includes a six page consumer brochure, envelope stuffers, technical specification sheets, and dealer aids — Day & Night Div., Affiliated Gas Equipment, Inc., 800 Royal Oaks, Monrovia, Calif. Engineering and installation literature is also available,

including installation and maintenance bulletins, as well as a complete manual of forced air heating practice.

AA 101

### Flashings

"CHINC" (copper-zinc sheet metal) through-wall flashing designed to bond in three directions is described in a four-page circular — Cheney Flashing Co., 623 Prospect St., Trenton, N. J. Illustrated are the dovetail type, produced in 42 in. lengths, and the sawtooth design, produced in 100 lb rolls.

AA 102

### Roof Exhausters

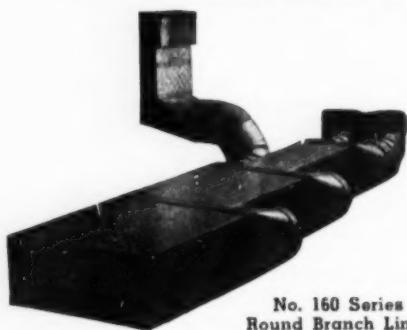
BELT DRIVE, propeller type "Skymaster" roof exhausters are described in a two-page catalog insert — Acme Equipment Co., Muskogee, Okla. Features of the unit include a galvanized steel housing painted with corrosion resistant finish, continuous duty motors, and a tilting hood and access doors to simplify servicing. Specifications are given for fan sizes ranging from 24 to 60 in.

AA 103

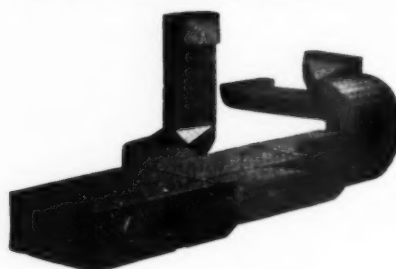
### Hole Punching Units and Drilling Machines

CATALOG C (16 pages) describes and illustrates types C, E, and EJ hole punching units which were developed especially for punching holes in angles, extrusions, shapes and sheets — Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y. Type C units may be equipped with adjustable adapters for a front-to-back adjustment

## GRAY "Snap-Rite" FURNACE PIPE AND FITTINGS AIR CONDITIONING PIPE AND FITTINGS



No. 160 Series  
Round Branch Lines



No. 170 Series  
All Square Lines

A complete line of Gravity and Forced Air Pipe and Fittings with our positive "SNAP-RITE" Lock for quick assembly and erection. Wall Stack and Fittings in 3 1/4" standard depths. Truck Pipe and Fittings in 8" standard depths.

Write for Catalog

## GRAY METAL PRODUCTS, INC.

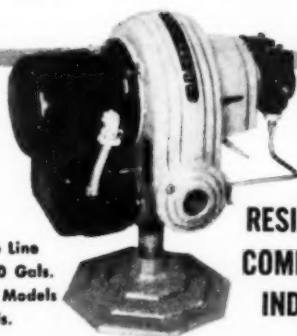
30 Carlton Street

Rochester 7, New York

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A Complete Line  
from ¼—30 Gals.  
Shell Head Models  
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RESIDENTIAL  
COMMERCIAL  
INDUSTRIAL

### Every PROFIT Reason Says—BUY RADIANT!

**Performance**—Equal to the highest priced burners.

**Price** — Meets competition every time . . . plus —

**Low Upkeep** — Factory Guarantee . . . National

**Distribution** . . . Protected Territories . . . Easy

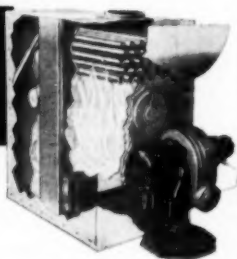
**Installation** . . . Minimum Servicing.

### THE Radiant OIL FIRED WINTER AIR CONDITIONER

*Precision Engineered for Economy  
in Price—Installation—Operation*

**SUPERIOR DESIGN** — Tubular construction presents greater heating surface to flue gases than conventional furnaces . . . jacket is substantial and well finished . . . high temperature combustion chamber . . . motor driven blower unit and air filters.

**FACTORY ASSEMBLED**—Shipped complete with combustion chamber installed and jacket completely assembled.



Available in  
Four Models:  
Low Boy,  
Suspended Unit,  
Hi Boy,  
Counterflow

**WRITE FOR COMPLETE  
RADIANT LITERATURE.**

**You'll sell—  
and profit more!**

**RADIANT UTILITIES CORP.**

8817 18th Avenue, Brooklyn 14, N. Y.



## USE FOLLANSBEE TERNE METAL FOR ALL THESE JOBS



**WEATHERSEALING**

**RAIN GOODS**

**TERMITE SHIELDS**

**COLD AIR DUCTS**

**COMPLETE ROOFS**

Follansbee Seamless Terne Metal is tough, durable and malleable—ideally suited for use wherever metal protection is required. Easy to handle, easy to cut and bend, easy to install, this versatile Terne Metal is tops with sheet metal men everywhere.

Properly installed and maintained, Terne Metal weather-sealing will outlast any other roofing material with which it is used. Complete roofs of Follansbee Terne Metal will last as long as the building stands. This means you can give your customers complete assurance of a top-quality job.

Here's why you'll like Follansbee Terne Metal:

- Will not flake.
- Clean to handle.
- Flashes with any other material.
- No electrolytic action.
- Expansion and contraction are never a problem.

It is carried in stock by leading sheet metal distributors everywhere.

Write us today for installation details and information on the many uses for this familiar, versatile product.

## FOLLANSBEE STEEL CORPORATION

GENERAL OFFICES, PITTSBURGH 30, PA.

COLD ROLLED STRIP

SEAMLESS TERNE ROLL ROOFING

POLISHED BLUE SHEETS AND COILS

*Sales Offices*—Chicago, Cleveland, Detroit, Indianapolis, Kansas City, Los Angeles, Milwaukee, Nashville, New York, Philadelphia, Rochester, San Francisco, Seattle; Toronto and Montreal, Canada. *Mills*—Follansbee, W.Va.

FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.



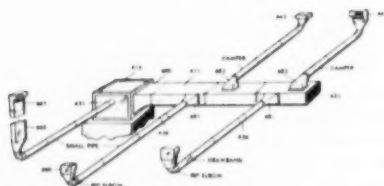


there's only ONE

**CHAMPION**

CHAMPION pipe and fittings *guarantee* better performance. Because each piece is machine-made from precision dies, they always fit perfectly. You save on labor . . . eliminate time-consuming shop time . . . simplify your installations. It adds up to *more* jobs done *better* in *less* time.

#### NEW SMALL PIPE SYSTEMS



CHAMPION offers an unusually complete line of both conventional and small pipe fittings—for either extended plenum or individual pipe system.

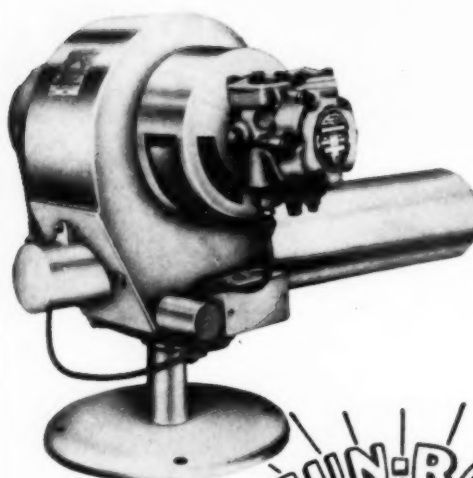
Pick yourself a winner. Order CHAMPION for your next job.

**CHAMPION  
FURNACE PIPE CO.**

211 Eaton St.

Peoria, Illinois

## Steal Money from the Chimney



**SUN-RAY**  
SERIES S  
OIL BURNERS

**Cut heating cost  
up to 36%**

Fuel dollars that ordinarily go up the chimney are kept in the owner's pocketbook when a Sun-Ray Series "S" Oil Burner is on the job. That's why more Sun-Ray burners are being installed than ever before. Want proof? Then...

#### Check These Sun-Ray Features

1. Sun-Ray Aerodynamic Housing.
2. Sun-Ray Combustion Head.
3. Delayed Action Oil Brake.
4. Precision Construction.
5. Burns Catalytic or Distillate Oils.
6. Ideal for Conversions or New Furnaces.

#### Against These Performance Results

1. Highest CO<sub>2</sub>.
2. Lower stack temperature.
3. Less draft required.
4. 500° to 600° higher flame temperature.
5. Cleaner combustion—always.
6. Most economical heating.

#### And You'll Want to Sell Sun-Ray

Outstanding leader in quality, popularity and profit potentials. Write today for complete information.

Sun-Ray Models from 0.5 to 25 G.P.H.



SUN-RAY BURNER MFG. CORP.

139-34 Queens Boulevard

Jamaica 2, N. Y.



of 1½ in. maximum. The other types are made only to customers' requirements for punching holes in specific shapes of extrusions. Also available is Catalog DM, featuring deluxe and standard models of drilling machines. This machine is designed for layout, drilling, reaming and boring of holes. AA 104

#### Gas Fired Furnaces

FOLDER covers gas fired forced air furnaces featuring a dimpled heating element that employs the venturi principle to achieve even heat distribution throughout the unit — Royal Heaters, Inc., 1024 Westminister Ave., Alhambra, Calif. Units are 72 in. high and 20½ in. deep. Other features are removable panels to facilitate servicing and a direct drive, cork insulated motor and blower combination designed to reduce noise. AA 105

#### Air Conditioner Selection

A ROOM AIR CONDITIONER selection chart is designed to simplify selection of the proper size equipment required for different size rooms under various conditions — Quiet Kool Div., Quiet Heat Mfg. Co., 46 Oliver St., Newark 5. Factors taken into account are location, direction of exposure, day or night operation, ceiling heights, floor area in sq ft, amount of windows and insulation, and placement of rooms. AA 106

#### Suspended Space Heaters

BULLETIN No. 543 illustrates a line of suspended space heaters for use with any type of gas fuel — Dravo Corp., 1203 Dravo Bldg., Pittsburgh 22. The folder gives complete specification data with dimensions and capacities of both propeller fan and blower type units. Available output capacities of the heaters range from 70,000 to 178,000 Btu per hr. AA 107

#### A-C Welding Equipment

THREE BASIC A-C welding machines and their accessories are described in a 17 page booklet (B-5622) — Westinghouse Electric Corp., Box 2099, Pittsburgh 30. Information is given on a general purpose unit, a 200 amp welder with a built-in high frequency stabilizer, and a general and special purpose 80 volt machine. Electrical specifications, physical dimensions, and weights of the various models are given, and special characteristics are described in detail. AA 108

#### Ducts and Fittings

BOOKLET illustrates sheet metal ductwork, including ells, end caps, take-offs, etc. — Cross & Currier Mfg. Co., Inc., 173 Washington St., Claremont, N. H. Also included in the booklet are prices and sizes of registers available. AA 109

#### Exhaust and Make-up Air Systems

A FOUR PAGE BULLETIN (No. 115) deals with the problems resulting from the relationship of exhaust to make-up air systems, and the bearing it has on the heating load — National Association of Fan Manufacturers, Inc.,

# Use quickdraft

THE DRAFT CREATOR  
that makes all chimneys friendly

ON MODERNIZATION AND  
NEW CONSTRUCTION

for bigger profits...  
warmer friends

Now you can assure your customers against trouble with condensation on gas-fired heating plants—puffing, sooting and pulsating on oil burning equipment—smoking, puffing and clogging on coal furnaces—common difficulties caused by faulty or inadequate draft.

Short chimneys used in today's one-story and basementless homes do not provide sufficient draft to support full combustion and carry off all troublesome combustion products. Popular outside chimneys require longer to heat up and establish necessary draft. Long runs and ells in smoke pipes and angles in chimneys cut down draft.

**quickdraft** overcomes these faults immediately and effectively. It creates full draft when firing begins and drives combustion products up the chimney. It operates through the firing period but does not "build up" excessive draft. **quickdraft** places no obstructions in the smoke pipe.

Simple, fool-proof, built for long service, **quickdraft** is reasonably priced . . . consumes no more current than a lamp bulb . . . and **quickdraft** is as easy to install as a length of smoke pipe which it replaces.

To make bigger profits and warmer friends, use **quickdraft** to prevent draft trouble on new construction, and to correct draft trouble on modernization work.

IMMEDIATE DELIVERY  
all standard sizes

Write or  
wire for  
Installation  
Manual  
and details.



**quickdraft**  
COMPANY

DIVISION OF THE HALL'S SAFE COMPANY, INC.

1640-D Cleveland Ave., NW, Canton 3, Ohio

2159 Guardian Bldg., Detroit 26. The bulletin is illustrated with a line drawing of a typical exhaust system and shows how make-up air balances exhaust air, eliminating cold drafts and controlling infiltration. AA 110

#### **Stainless Steel Bars**

A TECHNICAL BOOK on stainless steel bars includes information to aid the user in the selection of the proper stainless steel material for various applications (28 pages) — Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22. Reference tables on sizes and shapes available, weights and corrosion resistance are given. A section of fabrication and processing information for users of stainless bars is included, which covers cutting, welding, forging, upsetting, machining, drilling, reaming, tapping, threading, turning, milling, annealing and heat treating. AA 111

#### **Decimal Equivalent Decal**

DECIMAL EQUIVALENTS in 64ths are shown in a 6 x 1 1/4 in. decal — The Meyercoed Co., 5323 W. Lake St., Chicago 44. The decal is designed for application to slide rules, T-squares, drawing boards, desk tops and other drawing equipment. AA 112

#### **Window Planning in Air Conditioning**

THE PART PLAYED by windows in the year 'round air conditioned home is described in an eight page pamphlet (Form M-23) entitled *Glazing the Air Conditioned Home*

— Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3. Included are discussions on planning windows for most efficient conditioning, choices in window glazing, winter and summer effectiveness of "Thermopane", and types of sash to use. AA 113

#### **Duct Insulation**

A 16-PAGE design data booklet (IN6.A1) on duct insulation is illustrated with more than 40 photographs and drawings of various rigid and flexible insulations for the exterior and interior of warm and cold air ducts — Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1. Included is information on a liner which may be installed on metal sheets before they are bent to form ducts. AA 114

#### **Vibration and Noise Isolation Bases**

VIBRATION AND NOISE isolation bases for fans and motors are described in detail in catalog FB-802 — The Korfund Co., Inc., 48-01-A 32nd Place, Long Island City 1, N. Y. Illustrations, descriptions and specifications are given for twin rail bases, "Vibro-Bar" bases, spring isolated fans, and other vibration isolation equipment. AA 115

#### **Gas Fired Heating Equipment**

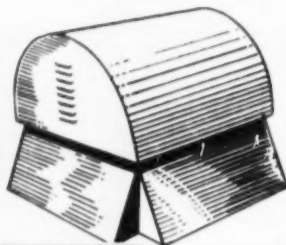
FORCED AIR gas fired furnaces for small home installations are described in data sheets and direct mail circulars — Utility Appliance Corp., 4851 S. Alameda St., Los Angeles 58. Included is information on Models 70 F.A.

# **PENN VENTILATORS**

**Perform Efficiently . . . Economically!**



**PENN  
AIRETTE**



**Penn  
DYNAFAN**

There is a type, size and capacity for all your ventilating requirements. Efficient and economical Penn Ventilators are easily installed and last long, providing years of trouble-free, inexpensive ventilation. They have been removing dust, vapors, smoke, heat, fumes and odors from public, commercial and industrial buildings for more than a quarter of a century.

Write for descriptive literature on the entire line or send us your specific problems for qualified recommendations.

Manufacturers of:  
Propeller Fan—Centrifugal Fan, Stationary, Rotary and Ridge Roof Ventilators and accessory products. Representatives and distributors in principal cities.

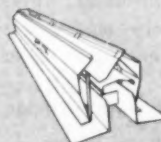
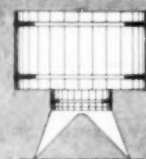


**penn  
POWER**



**PENN  
HI-EX**

**ROOF**



**PENN VENTILATOR CO.**

Main Office and Factory  
North Goodman St. & Allegheny Ave.  
Philadelphia 40, Pa.

**FOR MORE THAN 25 YEARS THE BUILDERS' ^TOP LINE!**



# The New No. 800 U. S. ROUND CEILING OUTLET DAMPER

**.. That You Have Been Waiting For**

The "ACE" of ALL  
CEILING DAMPERS  
LOW COST — Greatest  
Effective Efficiency



The No. 800 Series Dampers are Positively  
Locked-Type. Remain fixed in Set Position.  
Easily Adjusted With Ordinary Screw Driver.



The No. 800 Damper Permits Complete Balancing  
of System at the Outlet. Delivers Even Distribu-  
tion of Air When Valves are Even Half or Two-  
Thirds Closed.

Write for Your Late No. 53 Catalog  
Jobbers Everywhere

**UNITED STATES REGISTER CO.**  
BATTLE CREEK, MICHIGAN  
MINNEAPOLIS • KANSAS CITY • ALBANY

## It's a BETTER Oil Burner Installation with VENTALARM® Signal



The WHISTLING  
Tank Fill Signal

Safe Fills  
No Spills  
Oil man  
need never  
enter home.

TRADE LIST  
Model LA

**\$1.95**



## and SCULLY® Gauge

Easily read from even 10 ft. away  
Leak proof; adjustable to any angle;  
completely assembled.

TRADE LIST **\$1.45**

Easy to install  
whether or not oil  
is in the tank.  
Just use the  
"Button-Lift".

or this  
**Money-Saving Combination**

## VENTALARM®-GAUGE



VENTALARM Signal  
and SCULLY Gauge  
combined in one labor-  
and money-saving unit.

TRADE LIST

**\$2.95**

One item to install instead of three.  
For 275-gal. tanks. Specify tank  
opening and depth when ordering.

"Button-Lift"  
Installation

Lifting the button-  
indicator draws cork  
arm up close to main  
shaft for easy installa-  
tion even in partly  
filled tanks.



Trade Prices shown subject  
to change without notice.

See your regular Supply House  
or write to Dept. 72B

## SCULLY SIGNAL COMPANY

First Street, Cambridge 41, Mass.

Scully products are manufactured under U. S. and  
foreign patents or patents pending.

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## What Machine-Cast (Castomatic®) Solder Means to YOU...

It means that you can now get a bar solder that works faster, easier and better because it is made in enclosed molds, out of contact with air, on patented, electronically controlled machines.

Ordinary bar solder is hand-cast in open molds.

Castomatic solder of a given analysis always melts at the same temperature. Flow is uninterrupted, work easier. It has no hard spots; no voids to cause sputtering, no segregation to make melting uneven.

Federated research and field service men work constantly with hundreds of items of non-ferrous origin. What they know and learn about each of these helps to make Castomatic solder and every other Federated product the best that man and science can produce...

helps make Federated  
"Headquarters for Non-ferrous Metals."



## Federated Metals Division

AMERICAN SMELTING AND REFINING COMPANY  
120 BROADWAY, NEW YORK 5, N. Y.

In Canada: Federated Metals Canada, Ltd., Toronto, Montreal

Aluminum and Magnesium • Babbitts • Brasses and Bronzes • Anodes  
Die Casting Metals • Lead and Lead Products • Solders • Type Metals

and 100 F.A., featuring heat exchanger elements equipped with individual cast iron slotted port burners and an expansion section designed to absorb metal strains which produce the noises of expansion and contraction. Also described are Models 65-H and 90-H horizontal type furnaces, suitable for installation in attics, basements or under houses. AA 116

### Welding Electrodes

A 50-PAGE pocket guide (Form ADC 650) offers information on over 30 different electrodes — Air Reduction Sales Co., 60 E. 42nd St., New York 17. Procedures are given for welding stainless, mild and high tensile steels, cast iron and non-ferrous materials. AA 117

### Perimeter Diffusers

A PERIMETER DIFFUSER catalog gives descriptions of diffusers for both heating and cooling applications — Titus, Inc., 1304 Broadway, Waterloo, Iowa. Tables and charts are included giving specifications, engineering data, pressure requirements, etc. AA 118

### Incinerators

A DISPLAY KIT for merchandising gas fired incinerators includes display background, literature and direct mail pieces — L. J. Mueller Furnace Co., 2005 W. Oklahoma Ave., Milwaukee 15. The incinerators are designed for basement or utility room installation. AA 119

### Year 'Round Air Conditioning Equipment

A 20 PAGE BOOKLET, entitled *Fourth Dimension of the Modern Home*, describes year 'round residential air conditioning equipment — Servel, Inc., 119 Morton Ave., Evansville 20, Ind. The brochure, written to help consumers understand air conditioning, stresses the advantages of comfortable indoor temperatures — a home's "fourth dimension". AA 120

### Servicing Warm Air Furnaces

A 75 PAGE SERVICE MANUAL contains detailed instructions on the installation, operation and maintenance of warm air furnaces — Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7. The manual also provides a list of service parts for furnaces, and contains literature on controls, regulators, valves, nozzles, motors, and similar components of gas and oil fired warm air units. Copies are priced at \$3.00 and should be obtained direct from the company. Additions and revisions will be sent to all catalog holders without charge.

### Designing, Installing Residential Cooling

INFORMATION FOR estimating and designing residential cooling installations is given in a 26 page cooling design manual written for dealers, builders and architects — L. J. Mueller Furnace Co., 2005 W. Oklahoma, Milwaukee 15. A step-by-step design procedure is given, along with the necessary tables for register, duct and equipment size. Price of the manual is 75 cents. Orders should be sent direct to the company.



# MAXITROL

does many things  
much better  
IN THE FIELD OF GAS  
PRESSURE REGULATING

MAXITROL  
—first in perfecting high capacity gas pressure regulators with the now-famous "Straight-Thru-Flow" principle . . .  
—first in the development of a modern appliance regulator incorporating a non-metallic seat . . .  
—first in imaginative engineering for creative product development . . .  
MAXITROL pledges continued advancement in the gas pressure regulator field—your guarantee of greater efficiency for your product at lower cost!



**MAXITROL**  
C O M P A N Y  
*formerly*  
DETROIT REGULATOR CO.

12200 BEECH ROAD • DETROIT 28, MICHIGAN

Sold on the Pacific Coast by: PACIFIC SCIENTIFIC CO.  
San Francisco, Los Angeles, Seattle, Portland

Tomorrow, as yesterday, you may look to  
MAXITROL for engineering and  
product leadership.

## LOOKING FOR WALL BASE HEATING FOR WARM AIR FURNACES?

**GET BRANDES!**

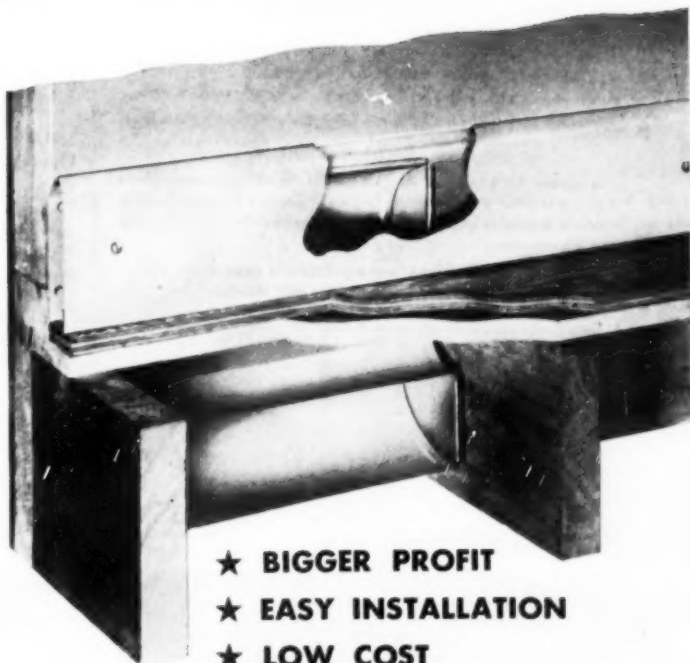
Sell Brandes — the wall base heating that's designed for forced warm air systems. It's easy to install — spreads heat evenly to blanket the entire wall — low in cost! Let us give you complete facts and figures — write today!

**BRANDES COMPANY**

2046 Winnebago

MADISON 4,

WISCONSIN



- ★ BIGGER PROFIT
- ★ EASY INSTALLATION
- ★ LOW COST

\*The First, and Patented



## LO-BLAST ECONOMITE

... proves amazingly successful in cutting heating costs and improving comfort

A heating engineer writes:

"We got the gas bill and could hardly believe what we saw. Where we used to pay between \$30 and \$40 per month for oil and another \$7 to \$10 for bottled gas, our total for last December came to \$16.17 (compared to over \$40 for December, 1949).

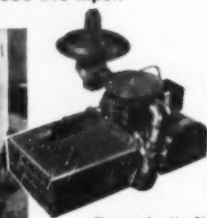
"Our electric bill was also smaller and to top it off, our house was more comfortable, even though December, 1950 was a colder month than December, 1949. The pilot flame of the gas burner seems to supply just the right amount of heat to the furnace walls to maintain a temperature just below the cut-in point of the fan control. A few seconds after the burner starts, the blower starts and thereby stratification is practically eliminated.

"In my 20 years' experience as heating engineer, I have never been more pleased with the performance of any apparatus than the Economite." (Name and address on request)

### Dealers!

The above letter shows why Lo-BLAST Power Gas Conversion Burners sell! For over 19 years Lo-BLAST Burners have cut heating costs in buildings of every size and character. Write—today—for full information.

Lo-BLAST Burners are available in capacities from 70,000 to 20,000,000 BTU input.



The standard Lo-BLAST Power-type Gas Conversion Burner

**MID-CONTINENT  
METAL PRODUCTS CO.**  
1960 N. Clybourn Ave., Chicago 14, Ill.

*we hear that...*



SEVENTY-ONE SALESMEN recently completed a week-long training course at the Timken Silent Automatic plant in Jackson, Mich.

THE TIMKEN SILENT AUTOMATIC DIV., Timken-Detroit Axle Co., is providing sales training courses for new retail dealers' salesmen throughout the country. First of the schools in the summer series was conducted by R. M. Marberry, national sales manager.

THE GENERAL ELECTRIC Co.'s Air Conditioning Div. plans to move part of its home heating and cooling department to Trenton, N. J. Production is expected to begin in the new quarters by the end of the year.

INSTALLATION of an air conditioning system in the liner *M. S. Kungsholm* has been completed by the Carrier Corp. Passenger accommodations, living quarters for officers and crew and a large area of the service spaces are conditioned.

Homes in the 40-house development at Briar Woods, White Plains, N. Y., are all air conditioned with the company's Weathermaker units. Prices of the homes start at \$28,500. Three-bedroom ranch type homes featuring Carrier air conditioning were recently displayed at the Daylesford Village, Pa., development. These homes are priced at \$16,500.

Six residential subdivision builders in St. Louis have joined with Carrier and its local distributor, Sears and Pious, to present completely air conditioned display homes, in all parts of the city, ranging from \$12,000 to \$20,000 in price.

THE KOLD-HOLD MFG. Co., Lansing, Mich., has changed its corporate name to Tranter Mfg., Inc.

BARTH ENGINEERING AND MFG. Co. has started work on a plant addition which will increase working area by 2500 sq ft.

THE NEW ADDRESS of the Emerson Electric Mfg. Co.'s Davenport district office is 617 Brady St.

THE DEALER SALES COMMITTEE of the residential gas section, American Gas Association, has completed an eight-

**CUSTOM BUILT—  
QUANTITY PRICED**

**atlas**

## BOILER JACKETS

YES, Atlas combines highest quality with lower costs by using basic styles and eliminating tooling costs. You can get boiler jackets custom built to your specifications from ATLAS at prices that will surprise you. ATLAS offers three flush type boiler jacket styles to meet manufacturers' demands. All are of heavy gauge steel, with baked enamel finish, ready for quick installation. You'll find them all the last word in appearance and value.



### ECONOMY

Square type construction is featured in this model. In spite of its fine appearance Economy is competitive in price. Ideal for large scale housing projects where price is a major factor.



### QUALITY

The richness of the round-cornered top is combined with the simplicity and economy of the square-cornered body. This style is competitive in price with all standard construction designs.



### DELUXE

This fully round-cornered design is Deluxe in every way. The full radius on all corners lends massiveness and beauty to its expensive appearance. Use Deluxe for your select dealer trade at surprisingly low cost.

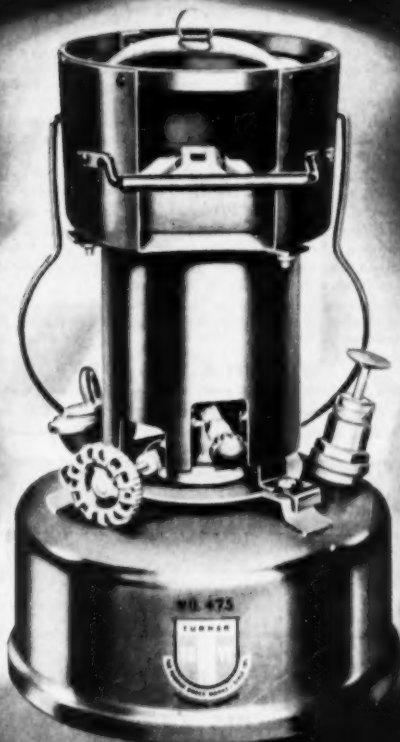
Atlas also manufactures cabinets for heating, cooling and air conditioning units, and furnace cabinets of any style. We will be glad to quote cost estimates on any type of boiler jacket or cabinet on receipt of your specifications and requirements.

**Atlas MANUFACTURING  
COMPANY**

EUSTIS AT ROBBINS ST. • ST. PAUL 4, MINN.

**TURNER**

*Quality Since 1871*



### No. 475 Low Pressure TINNER'S FIRE POT



● Smokeless...sparkless...sootless! Complete with Turner's exclusive "Carburetor Control" for more perfect combustion; also a flame control—for exact heat desired—which automatically cleans the orifice. Construction assembly permits quick, easy accessibility...windshield, top-plate, and bail handle are one unit, and can be lifted from tank by loosening one wing nut. Burner coil is made of extra-heavy seamless steel tubing, protected by sturdy outer jacket that maintains heat without overheating; can be generated and used in heavy wind. Fuel capacity—one gallon; burns for 9 hours on one filling. Get details, too, on Turner's popular Plumber's Fire Pot (No. 275); also Turner's complete line of Blow Torches.

See  
Your  
Jobber

**THE TURNER BRASS WORKS**

SYCAMORE ILLINOIS  
Since 1871

# It's the **LOW DOWN** DIRT trapped by **WILSON'S HAIR FILTERS** that **GUARANTEES LONGER LIFE**

In Wilson Hair Filters the entire dust-holding capacity is completely utilized. This means, no surface dust stopping only, but Full-Depth Dust Trapping at its best . . . and many extra months of filter life.

The reasons are so simple:

1. The hair media in Wilson Hair Filters act in the same manner as Mother Nature's proven way of filtering the air you breathe. It's the hair that cleans the air . . . more easily, more effectively, more economically.
2. The multi-directional distribution of the hair in Wilson Hair Filters literally invites all dust and dirt to come in and be trapped throughout the entire filter interior.
3. Most brands of air filters require oiling on their inlet surfaces. This stops dust prematurely, loads up the incoming air side and materially shortens filter life.

Wilson Hair Filters are not oiled on the inlet side. Instead, they receive an even distribution of mineral oil on their outlet surface, which:

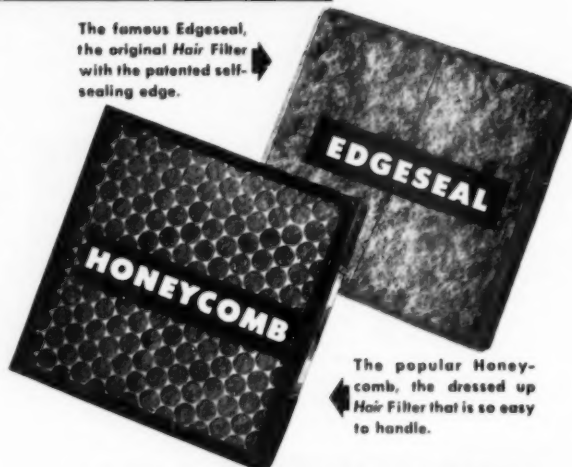
- (a) augments the already amazing ability of the hair itself, to catch and hold dust, and—
- (b) builds an impregnable barrier which halts dust and dirt after reaching the furthestmost practicable penetration point.

## WILSON & CO., INC.

(Air Filter Division) 4100 South Ashland Ave., Chicago 9, Ill.

Wilson Hair Filters are another quality product of Wilson & Co., world-famous for meat products, sports equipment, pharmaceuticals, hair products, etc.

The famous Edgeseal, the original Hair Filter with the patented self-sealing edge.



The popular Honeycomb, the dressed up Hair Filter that is so easy to handle.

Save delay. Save dollars. Save doubt. Send for FREE sample with details and prices.



# WILSON'S HAIR FILTER



## THIS AMAZING NEW BETT-MARR outperforms sheet metal saws costing six times as much

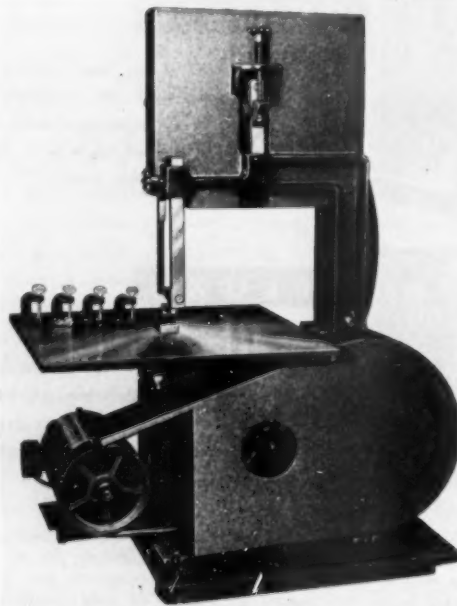
For faster, smoother, more accurate cutting of galvanized sheet metal, there's nothing better than a Bett-Marr—yet, it actually costs so little, no shop can afford to be without one.

The all-cast frame of the new, improved Model 14 SM assures the utmost in stability and accuracy and reduces vibration to a minimum.

**CUTS 50 to 70 STACKED SHEETS**—of galvanized sheet metal up to 15 inches per minute. An all purpose 14 inch bandsaw with life-time sealed precision bearings.

**SMOOTH, POWERFUL CHAIN DRIVE**—Blade speeds from 125 to 2200 FPM quickly adjustable for metals, plastics, wood, castings or forgings.

**POSITIVE BLADE CONTROL**—Case hardened guides with carbon back-up bearing (adjustable up to 1/2" blade width) assure accuracy. Flanged wheels control blade for perfect radius and straight line cuts.



**BETT-MARR MFG. CO. HOPKINS, MINNESOTA**

☐ Please send me more information on the Bett-Marr sheet metal saw

☐ Where can I buy a Bett-Marr

Name .....

Address .....

City ..... Zone ..... State .....

Shown above  
**MODEL 14 SM\***

Depth of Cut 8 1/4"  
Blade to Frame 13 1/2"  
Table Size 20x22"  
Overall Depth 34"  
Blade Length 97"

\*Includes set of 4 sheet metal clamps and riser bar insert to match for sheet metal work.

**MAIL COUPON TODAY . . . GET THE AMAZING FACTS**

Learn how you can cut production costs with a Bett-Marr sheet metal saw. It pays for itself quickly in both large and small shops. (Equipment dealers—write for information on available territories.)



*we hear that . . .*

unit packaged dealer sales program which is available for use by the gas industry.

Fredric Moshier, formerly assistant to the director of the natural gas department of the association, has been appointed assistant secretary of the AGA operating section. In this capacity he will assist in coordinating the activities of the natural gas branch of the industry with the programs of the operating section.

CONSTRUCTION of a new addition has begun at the Salt Lake City plant of The Ruberoid Co.

A 5 HP PACKAGED residential air conditioner and an oil-fired forced warm air furnace of Airtemp Div., Chrysler Corp., comprise the year 'round unit in *House and Garden's* 1953 "Home of Ideas," now open in Bryn Mawr, Pa. A water cooling tower is located behind the house. Under normal conditions, about 90 per cent of the water used to cool the refrigerant is re-used.

More than 160 of the division's dealers attended a special meeting held at the Essex House, New York City, to see the company's line of central type air cooled residential air conditioners.

C. Robert Ingram, dealer for the division in the Oklahoma, western Arkansas and Texas panhandle area, recently opened a \$150,000 plant at Oklahoma City. Approximately 2000 visitors attended the dedication ceremonies.

SIXTY-TWO warm air space heaters, in capacities ranging up to 2,000,000 Btu per hr, were purchased from the Dravo Corp. by the Pittsburgh Steel Co. to provide heating for the blooming mill, sheet strip and pipe mill buildings at its Allenport, Pa., plant.

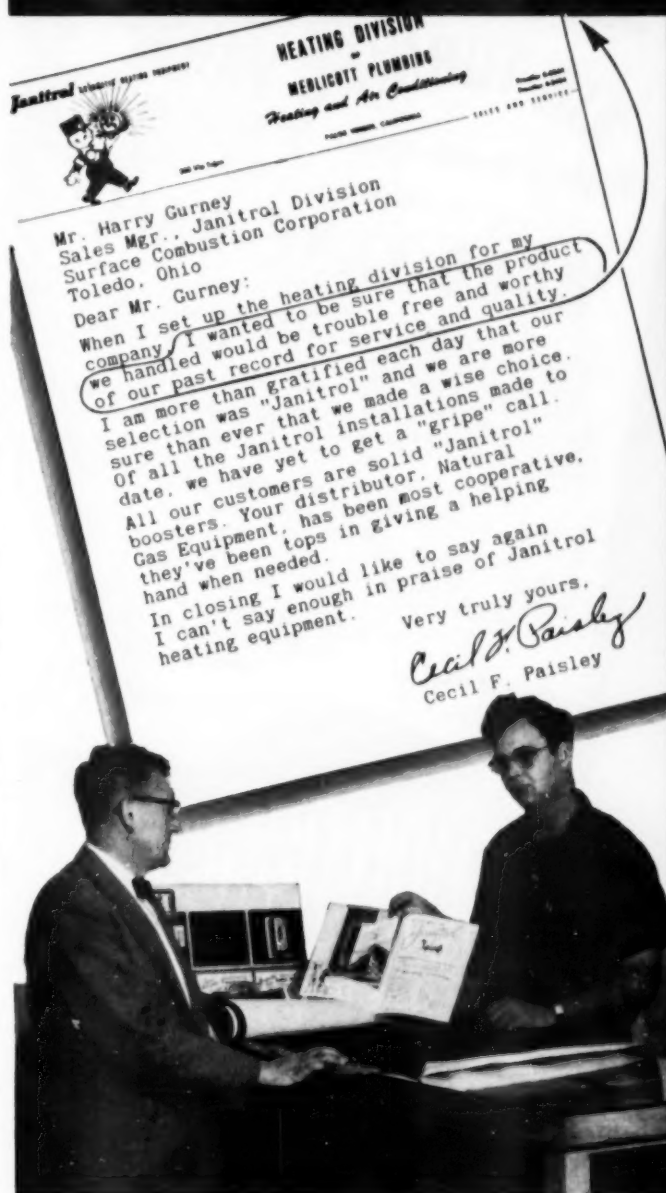
PLASTEEL PRODUCTS CORP. has concluded an arrangement under which it will supply Nelson Rivweld studs direct to purchasers and applicators of its steel roofing and siding materials.

EXECUTIVE PERSONNEL of the Air Conditioning Div., Remington Corp., recently met at Skaneateles, N. Y., with sales managers and representatives from all parts of the country to discuss plans for sales of the company's room air conditioners in 1954.

AMERICAN RADIATOR and Standard Sanitary Corp. has established a new division — The Sunbeam Air Conditioner Division — at Elyria, Ohio, to manufacture and sell warm air heating equipment and cooling products. Thomas W. McNeill is president of the division.

WESTINGHOUSE salesmen can give quick desk-top demonstrations of certain air conditioning units with a miniature two-section model that can be disassembled to show how a unit can be adapted to individual space requirements.

# "I SELL JANITROL BECAUSE"...



**HEATING DIVISION**  
**MEDICOTT PLUMBING**  
*Heating and Air Conditioning*

Janitrol Automatic Heating Equipment

Mr. Harry Gurney  
Sales Mgr., Janitrol Division  
Surface Combustion Corporation  
Toledo, Ohio

Dear Mr. Gurney:

When I set up the heating division for my company, I wanted to be sure that the product we handled would be trouble free and worthy of our past record for service and quality. I am more than gratified each day that our selection was "Janitrol" and we are more sure than ever that we made a wise choice. Of all the Janitrol installations made to date, we have yet to get a "gripe" call. All our customers are solid "Janitrol" boosters. Your distributor, Natural Gas Equipment, has been most cooperative, they've been tops in giving a helping hand when needed. In closing I would like to say again I can't say enough in praise of Janitrol heating equipment.

Very truly yours,  
*Cecil F. Paisley*  
Cecil F. Paisley

The unsolicited letter from Mr. Paisley tells you far better than we can express the reasons we have repeatedly stated . . . "Janitrol is Easier to sell than sell against".

An authorized Janitrol dealership may be open in your community, write today for complete information.

**Surface Combustion Corporation • Toledo, Ohio**



# Save money making AIR TURNING VANES

Single or Double Blade... for Square Elbows

with the New Engineer Approved

## "DURO-VANE-RAIL"

Trade Mark



ONE hammer blow secures Blade with positive lock, rattle free

YOU make Blades of scrap. Cut square, no notching.

"DURO-VANE-RAIL" supplied in 8 foot lengths.

Patent Pending

WRITE TODAY

For folder on how to make Engineer Approved Air Turning Vanes using "DURO-VANE-RAIL"

Save Money  
Save Time

DEPT. 1B

# DURO-DYNE

CORPORATION

38 South Franklin Street,  
Hempstead, L. I., N. Y.

# Save money on Multi-blade DAMPERS

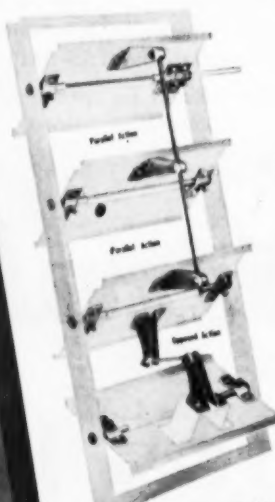
Make your Dampers with

## "DURO BLADE KIT"

PRECISION-ENGINEERED  
**DAMPER  
HARDWARE**

Note Parallel  
OR Opposed blade action

- Each blade quickly adjustable
- Tilting brackets line up automatically After Installation (can use inexperienced labor)



Write for Samples & Prices **DEPT. B**

we hear that . . .

YORK-SHIPLEY, INC., will handle all summer air conditioning requirements for homes to be built in 1953 by Levitt and Sons.

SEQUOIA MFG. CO. has opened a new branch at 15 N. Oakland Ave., Pasadena, Calif.

MARTHA MILLER, a graduate of the sales training course conducted at Winkler Institute, recently put her training to work, according to *Survey*, published by the U. S. Machine Div., Stewart-Warner Corp. Sent to handle office details at a new branch at Lancaster, Pa., Miss Miller made some sales in the showroom, then continued selling along a trailer route, which included a number of street fairs in the vicinity of Lancaster.

A NATIONWIDE sales campaign promoting the electronic "Modulflow" system of temperature control for homes has been launched by Minneapolis-Honeywell Regulator Co. Double-page spreads will be used in consumer magazines, and four-page, four-color inserts will highlight the campaign in trade publications.

Robert A. Lawder, sales manager of the company's apartment house division, was recently elected president of the New York Sales Managers Club.

THE DOALL Co. has developed a technique whereby its bandsawing machine can be remotely controlled for use in operations such as cutting explosives, where there is a possibility of harm to the operator if an explosion should occur.

WORTHINGTON CORP. plans to expand its air conditioning equipment manufacturing facilities with the construction of a new plant in Decatur, Ala.

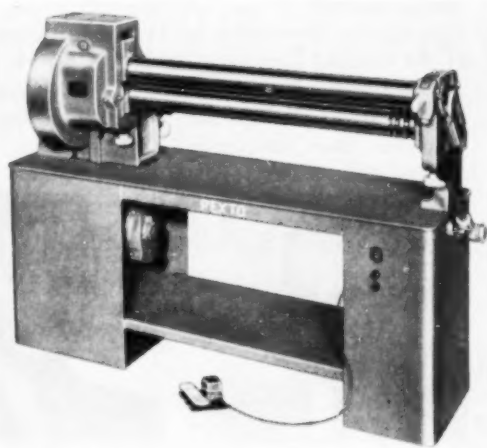
AT THE RECENT national sales meeting of the Lau Blower Co., E. C. Wolford received his 15 year service pin. Mr. Wolford, who serves the New England area, has the longest tenure of consecutive sales force service in the company.

FIRST OF the homes in the Rosemont development in Philadelphia was recently completed and has been opened for six months' public inspection by Madison Builders, Inc., and the Herman Goldner Co., air conditioning distributor for Servel, Inc. All of the major appliances in the homes, including incinerator, refrigerator, etc., as well as the year 'round air conditioning unit, will be gas-operated. Basic homes will be priced at \$42,500. With completed second-floor bedrooms, a price of \$46,000 is quoted.

WORK has begun on a new span which will permit the addition of reinforcing bar fabricating operations at the Spokane, Wash., plant of Joseph T. Ryerson & Son, Inc. Approximately 10,000 sq ft of working space will be made available for this purpose.

# A NEW PEXTO

## 3" POWER ROLL



NO. 3416-36"  
NO. 3418-48"

**THE PECK, STOW & WILCOX COMPANY**  
SOUTHINGTON, CONNECTICUT

Since 1785

- **ALL 3 ROLLS DRIVEN**  
Powered 3rd roll picks up stock from pinch rolls. Rear roll grooved for easy start.
- **FORWARD-REVERSE FOOT SWITCH**  
For SAFE, instant control. Switch can be set for continuous or momentary contact — either direction.
- **REAR ROLL POSITION INDICATORS**  
For accurate duplication of work.
- **QUICK-ACTING ROLL RELEASE AND LIFTING LEVER**  
Roll can be opened and raised in one easy motion.
- **ALL STEEL BASE**  
Attractive design, rigid mounting, and motor housing.
- **"V" BELT DRIVE**  
Powerful geared-head motor drive thru "V" Belts. Magnetic starter.

6PX83A



*\*and naturally  
they're using*

**STANDARD'S NEW**

**Perimeter Floor Register**

*with Standard's exclusive  
DIALAMATIC CONTROL*

*\*This is it!*

**Model No. PH-142**

**Works Better**

**Made Stronger**



### SPECIFICATIONS

The face and blades of model PH-142 are fabricated of 16 gauge steel, the blades are set in a fixed-fan angle degree for even deflection. The frame is of one piece, 18 gauge steel construction. The Louvre box fabricated of 16 gauge steel. Packed one to a box, and 20 to a master carton. Comes handsomely finished in gleaming, durable metallic-lustre. 4 sizes available.

*For more information and Standard's  
New Pocket Catalog, attach this coupon  
to your business letterhead and mail to:*

**Standard Stamping & Perforating Co.**

3151 WEST 49TH PLACE • CHICAGO 32, ILL.

## The "Inside Story" of SIEMON <sup>As a Manufacturer of</sup> Power-Flame <sup>Gas Conversion</sup> SUPERIORITY

Power-Flame units (all models) are shipped completely assembled with controls wired. Just connect power and gas lines.

Quiet, properly-sized blowers provide balanced air mixture for very high heating plant efficiency.

Controls burner mounted and tested. Installation cost reduced to a minimum.

Motors properly-sized and properly applied bring to Siemon users a lifetime of trouble-free service.

Lighting made easy. Push button runner pilot on smaller capacities. Electric ignition on larger models.

STAINLESS STEEL DEFLECTORS provide final blending of fuel mixture — eliminating pulsation.

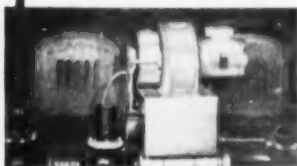
Balanced air adjustment. Precision built to provide metered air for complete combustion.

"Tube within a Tube" design. A Siemon exclusive means quietness and very high efficiency.



## The GAS Conversion Burner Engineered for "Hard to Fire" Applications

Forced-draft design reduces to a minimum the problem of natural drafts. Perfect inter-mixing of air and gas results in real fuel saving. Highly efficient in down-draft heating plants. Gun-type design permits installation in a minimum of space.



Another example of Power-Flame versatility. This installation made over a coal stoker.



Models in capacities from 85,000 to 3,000,000 B.T.U. input. All units are completely packaged and gun-type design. Installation costs reduced to a minimum.

You owe it to yourself to get the facts about Siemon's "profit plan." Write today for literature and information about Power-Flame Gas Conversion Burners.

**Siemon  
Power-Flame  
BURNER**

**Siemon Manufacturing Co.**  
1819 Holmes  
Kansas City, Missouri

## appointments . . .

DR. FINN J. LARSEN as director of research for Minneapolis-Honeywell Regulator Co. Dr. Larsen has been a member of the company's research and engineering organization since 1943. John McCardle, formerly manager of the Dayton sales office, has been appointed market manager of gas controls, with headquarters at Minneapolis. Karl Schick has been named sales manager of the Original Equipment Div. Mr. Schick has been sales manager of the gas controls division since 1949. Stephen M. Ramsey has been appointed manager of the Columbus, Ohio, sales office.



F. J. Larsen



Tom Gibbons

TOM GIBBONS as director of advertising and sales promotion for The Coleman Co., Inc. A. W. Boyer will be in charge of advertising and sales promotion of the company's open market products.

WALLACE B. BATEMAN, JR., as head of the newly formed air conditioning sales section of the Amer-glas Sales Div., American Air Filter Co., Inc. Mr. Bateman will have control of the planning and sales contact with original equipment manufacturers and distributors handling air conditioning and all-weather units throughout the nation. Charles J. Morrison has been appointed a sales representative of the division's products department. His territory will include the midwestern and north central states.



W. B. Bateman, Jr.



C. J. Morrison

NORMAN W. FOY as vice president in charge of sales of Republic Steel Corp. Mr. Foy has served as Chicago district sales manager, assistant general manager of sales, and general manager of sales. During World War II he was with the War Production Board in Washington, where he rose to be director of the steel division. L. S. Hamaker has been appointed general manager of sales



## You can Fit Every Conductor Pipe

from plain round to corrugated square and of any angle from 10 through 90 degrees, with rust-resisting elbows that are guaranteed for quality and service by the

TRADE *F. Dieckmann* MARK  
Established 1871

Your jobber carries a complete stock of Dieckmann elbows and shoes, manufactured of all standard roofing metals and hot-dipped galvanized after formation.



WRITE FOR COMPLETE CATALOG

**THE FERDINAND DIECKMANN COMPANY**

1300 HARRISON AVENUE

CINCINNATI 22, OHIO

# Low Cost

... WITH **AMAZING**  
**PERFORMANCE FAR BEYOND**  
**AVERAGE DEMANDS**

- HEAVY STEEL BODY WELDED CABINET

- FOUR SECTION PREHEAT CHAMBER

- AIR FILTER EXPANDED FIBRE 20" x 25"

- 1/2 HP MOTOR WITH VARIABLE SPEED PULLEY

- 12" WHEEL BLOWER

- RETURN AIR INLET 16 1/2" x 16 1/2"

- WARM AIR OUTLET 16 1/2" x 22"

- GUN TYPE BURNER

- STAINLESS STEEL COMBUSTION CHAMBER

- BAKED METALICANT CABINET FINISH



**HACKER**  
CABINET OIL BURNING FURNACE

- Here's a quality furnace that will do two very important things for you.

**FIRST...** it will keep your bids low. Give you contracts. Make you good profits against tightest competition.

**SECOND...** it will give years of trouble free performance and stop costly call-backs.

Shipped completely assembled. . . .

Write for **FREE ENGINEERING DATA.**

**--- FREE DATA ---**

Standard Heating Equipment Company  
Waterloo, Iowa

Gentlemen: Rush me complete money saving facts on the new Hacker oil-burning furnace.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

**MAIL  
COUPON  
TODAY!**

# Speed up Assembly!

## Switch to BLACK & DECKER POWER!



**BLACK & DECKER HOLGUN\*** drills holes to  $\frac{1}{4}$ " diam. in steel, to  $\frac{1}{2}$ " diam. in hardwood. Perfectly balanced, light in weight, compact, easy to handle, accurate. Famous "Pistol Grip and Trigger Switch."



**BLACK & DECKER SCRUGUN\*** drives machine screws and nuts and self-tapping screws to  $\frac{1}{4}$ ", wood screws to #12 x 2". Positive or adjustable clutch available. Same design features as B&D Holgun!

**SEE YOUR NEARBY B&D DISTRIBUTOR** for demonstrations and full details on this famous team of assembly tools. They'll help your men turn out more work, with less fatigue and less spoilage. And you have nearly 50 other B&D Drill and Screw Driver models to choose from to fit your needs on heavier work! Write for free catalog to: **THE BLACK & DECKER MFG. CO., 641 Pennsylvania Ave., Towson 4, Md.**

\*Trade Mark Reg. U. S. Pat. Off.



SHEARS



SANDERS



BENCH GRINDERS



HAMMERS

LEADING DISTRIBUTORS EVERYWHERE SELL



# Black & Decker

PORTABLE ELECTRIC TOOLS

### appointments . . .

and S. A. Crabtree and R. W. Helms have been named assistant general managers of sales.

R. A. SPROAT as assistant treasurer of Eureka Williams Corp. Mr. Sproat joined the organization in February of this year.

WILLIAM W. PACE as advertising manager of the South Wind Div., Stewart-Warner Corp. He will handle all media advertising in connection with the merchandising activities of the division throughout the country.



W. W. Pace



R. A. Sherer

R. A. SHERER as sales manager for White-Rodgers Electric Co. Mr. Sherer has been with the company since 1913, has previously served as Chicago district manager and Chicago regional manager.

RICHARD G. RAY as vice president in charge of manufacturing for General Controls Co. Mr. Ray will retain his former responsibilities as plant superintendent. I. H. Nye, treasurer of the company since 1946, has been elected to the company's board of directors. Mr. Nye is also assistant secretary and controller.



R. G. Ray



I. H. Nye

ROBERT D. JONES, for the past 17 years a field representative in the Los Angeles area for Libbey-Owens-Ford Glass Co., as Pacific regional sales manager of the Corulux Div. Six new fiber glass distributors have been named by the company. They are: Mid-State Steel, Inc., Nashville; Arnold-Brown Metals & Supply Co., Birmingham, to cover Alabama, Mississippi and West Florida; Paragon Supply, Inc., Syracuse, operating in central New York state from the Pennsylvania state line to the Canadian border; Parker Insulation Co., Salt Lake City; Metal Service Corp., Charlotte, to handle sales in North

# BARD MULTI RADIATOR WARM AIR HEATING

## WHOLESALE & DEALERS KNOW

Bard performance and efficiency are unsurpassed in oil- and gas-fired warm air systems.



## WHEN YOU PRICE BARD UNITS

You will realize that Bard values are greater than in any other complete line. This gives you more profit with satisfied customers.

WRITE FOR CATALOG & PRICES...

**BARD MFG. CO.** BRYAN, OHIO



## OUR ELBOWS HAVE PERFECT FORM

CONDUCTOR PIPE ELBOWS  
AND SHOES

- All Sizes • All Angles
- All Metals • All Gauges

SEE YOUR  
JOBBER



**The CINCINNATI  
ELBOW CO.**

2021 EASTERN AVE.  
CINCINNATI 2, OHIO



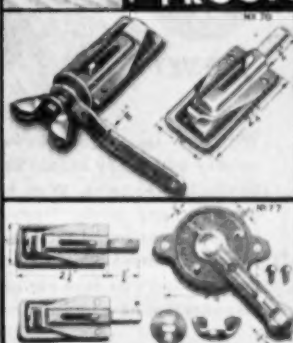
## Kwik-way DAMPER REGULATOR SETS

ONE SOLID  
HAMMER BLOW  
SETS THE BEARING



PERMANENTLY  
SECURE,  
RATTLE-  
PROOF!

No anvil required. Both bearings have retractable bolts for easier installation. Their convenience and time saving characteristics makes them by far the most economical sets when installed costs are considered. See your jobber or write for literature.



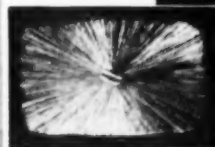
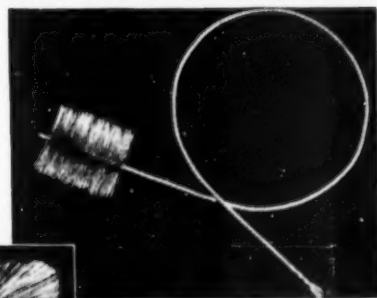
**HART & COOLEY MANUFACTURING CO.**

500 EIGHTH STREET

HOLLAND, MICH.

IN CANADA: HART & COOLEY MFG. CO. FORT ERIE, N., ONTARIO

## SCHAEFER FLUE AND FURNACE BRUSHES



TODAY'S TOP STANDARD  
IN QUALITY AND  
CLEANING EFFICIENCY

### RECTANGULAR WIRE BRUSHES with HANDLES

Specially developed "Silver Brite" Rustproof Wire means longer wearing, better cleaning, with these Schaefer brushes. In three sizes with 4-foot wire handles. Also available in black oil tempered wire. Write for special prices and complete catalog No. 650 on Schaefer Boiler and Furnace Brushes.

LOOK for the trademark

**SCHAEFER BRUSH MFG. CO.**  
117 W. WALKER STREET • MILWAUKEE 4, WIS.

**SCHAEFER BRUSHES**  
—MILWAUKEE—

BUY SCHAEFER  
...IT'S SAFER

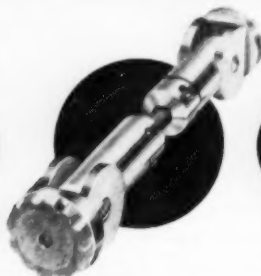
# THIS IS IT!

## LAY OUT ANY PATTERN IN A FEW MINUTES WITH THE NEW JET PATTERN DEVELOPER

**SAVES**

TIME  
MATERIAL  
LABOR  
SPACE

**MONEY**



**ONLY**

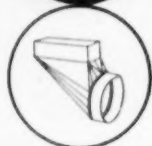
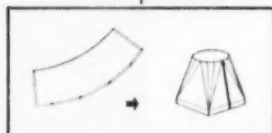
**\$69<sup>50</sup>**

COMPLETE  
WITH 30  
TEMPLATES

With the Jet Pattern Developer any mechanic can quickly and easily layout Square to rounds, Cones, Elbows, Intersections, Wye Branches, Register Boats, Dormers (any pitch), Transitions, Three piece transitional elbows round to square and thousands of other complex patterns. In fact we haven't found a pattern yet that can't be laid out in a few minutes time with this amazing new tool.



Simply attach templates, adjust for any pitch or offset and roll out your complete pattern. That's all there is to it.



Eliminates triangulation and radial lines, trimming, waste, large pattern stocks, and hours of time. You will save the entire cost of your JET PATTERN DEVELOPER in less than a week.

16 MM sound film available to groups

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Please send \_\_\_\_\_ Jet Pattern Developer(s) @ \$69.50 each.

- ☐ Full amount enclosed send Postpaid  
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☐ Send more information

NAME \_\_\_\_\_

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CITY \_\_\_\_\_ STATE \_\_\_\_\_

10 Day Money Back Guarantee—Please include state tax

## appointments . . .

and South Carolina; and Reliable Steel & Builders Supply Co., Los Angeles, as distributor throughout southern California and parts of southern Nevada.

GORDON GRAND, JR., as assistant to the president of Olin Industries, Inc., with headquarters in the New York offices. Previously Mr. Grand was chief counsel to the Republican members of the Ways and Means Committee, House of Representatives. Clarke Tryon has been appointed sales manager of the company's Ramset Fasteners Div., Cleveland. Jason H. Radding has been named merchandising manager of the division.

GEORGE S. ELDER and Robert B. Veith as area sales managers for Timken Silent Automatic Div., The Timken-Detroit Axle Co. Mr. Elder will handle the New England sales area and Mr. Veith will be in charge of an area composed of Maryland, Delaware, Washington, D. C., and parts of surrounding states.



G. S. Elder



R. B. Veith

EVERETT W. JOHNSON as eastern Iowa district sales manager for Century Engineering Corp. Mr. Johnson will make his headquarters in Cedar Rapids. The Diment Heating Supply Co., Syracuse, has been appointed wholesale heating distributor for the Syracuse area.



E. W. Johnson



H. W. Shirey

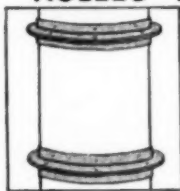
HAROLD W. SHIREY as manager of the Combustioneer Div., The Steel Products Engineering Co. Previously Mr. Shirey was a project engineer in radar developments.

ROBERT UNGER as service engineer at the Chicago office of the Wheelco Div., Barber-Colman Co. Harold L. Dirkers has been appointed sales engineer and Leonard V. Bloom, service engineer, at the Detroit branch. William E. King has been named service engineer at the New



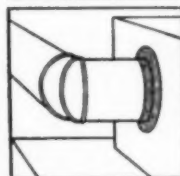
# ANGLE RINGS

## ROLLED TO SPECIFICATION!



### SMOKE STACKS

You can rely on our ability to furnish Leg Out ANGLE RINGS correctly rolled to specified size for use in smokestack construction. Bolt or rivet holes are accurately punched and spaced for quick and easy assembly.



### VENTILATING DUCT LINES

We also roll Angle Rings in all sizes for round duct connections in air conditioning, heating and ventilating systems.

All Rings correctly made to size—with a true circle and 90° angle. Furnished with or without bolt holes.



### EXHAUST FANS

Angle Rings save time and money in the assembly of fans of all types. Provides a solid and firm reinforcement for fan units as illustrated. Built to fit your particular assembly in any quantity.

Write for list of stock sizes and discounts—also our illustrated circular describing our complete fabricating service.

**NATIONAL METAL FABRICATORS**  
2140 S. Sawyer Ave. Chicago 23, Ill.

# WEBCO

*the portable*

## SHEET METAL BENDING BRAKE

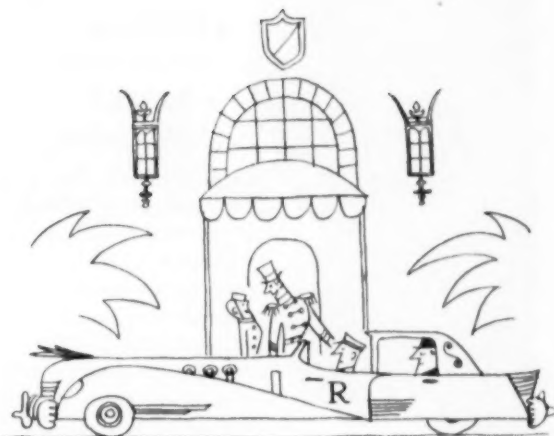


The WEBCO brake offers the Slip End, Sliding Folding Fingers, and many other important features. The WEBCO will make bends up to 52°. Write for detailed information to:

# HALLMOR

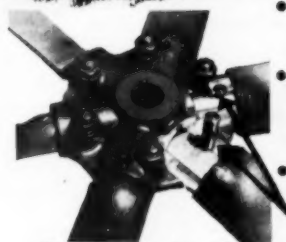
INC.

McMURRAY ROAD  
BRIDGEVILLE, PA.



"DIDN'T ROB A BANK—just took on the Royal-Jet line!" Royal Heaters won't make you a millionaire over night, but an active dealer sure can make an extra buck. Why don't you drop us a line—maybe there's a dealership open in your area. *Let's do it now!* Write Royal Heaters, Inc., Alhambra, Calif.

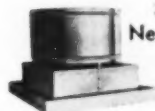
Every COOK Fan Blade is  
*Individually* precision set



- All blades balanced and set to proper pitch for rated horsepower and CFM.
- Aluminum hub and blade, cast separately, machined and fitted with precision accuracy.
- Blade is securely locked to hub for long life and true pitch by taper pin bolt.

The cut-away photo above shows why rugged Cook Fans last longer and actually deliver their stated capacity. Each blade is individually set to the proper pitch for the rated horsepower and CFM. Thousands of Cook-built propellers have already proved their dependability.

Sell Cook Industrial Fans and the New Cook "Chimney Style" Attic Fan



Up-Blast Roof Ventilator in 16" to 48" sizes. Automatic dampers. Acid resistant coated, aluminum blades, up to 40,000 cfm output.



"Patent pending."  
New "Chimney Style" Attic Fan saves attic space. Acid resistant coated steel chimney housing a direct drive fan. Easy to install, automatic dampers. Three sizes.



Cook Duct Fans. Direct or belt drive. Orifice 16" to 48". Ideal for spray booths.



Cook Type S Fans. Frame 24" to 48". Easy to install. Glass-insulated or explosion proof.



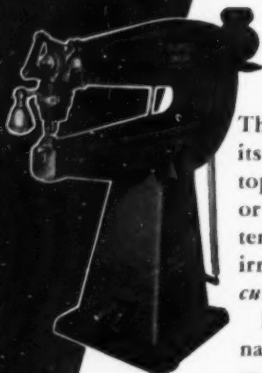
Portable Man-Cooler. Adjustable welded steel frame on rollers. Propeller 16" to 48".

# COOK

Write for new catalog to Dept. AA, Loren Cook Co., Berea, Ohio

# Libert Hi-Speed SHEAR

CIRCLE CUTTING  
ATTACHMENT  
Included as  
STANDARD EQUIPMENT  
with this Machine



**MODEL  
1236**  
36-in. throat,  
12-gauge capacity.

**WRITE FOR  
BULLETIN**

- **SIMPLIFIES  
Maintenance**
- **SPEEDS  
Production**
- **SAVES  
Manpower**

The *Libert* has amply proved its advantages by turning out top production—shearing flat or formed sheet metal, internal or external, plain or irregular shapes *rapidly, accurately, cleanly!*

Equally effective in maintenance work, *Libert* is cutting costs to rock bottom. Edges are smooth, need no finishing. Unskilled operators produce accurate work at once.

Sizes up to  
60-in. throat, 10-gauge capacity.

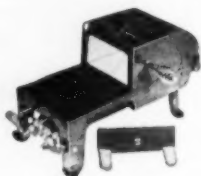
**LIBERT MACHINE COMPANY**  
Green Bay, Wisconsin

## MORE HEAT FOR YOUR DOLLAR WITH JOHNSON BENCH SOLDERING FURNACES

**1800°F. without forced air blast.**

### No. 101 Bench Furnace

The most efficient, powerful and economical bench furnace made for heating soldering coppers up to 12 lbs. per pair. Also used for heat treating, case hardening, and annealing carbon steels. Two burners. Firebox  $3\frac{3}{4} \times 4\frac{1}{2} \times 5\frac{1}{2}$ . Complete with work rest block and baffle plate. \$18.80 F.O.B. factory.



### No. 118 Combination Bench Furnace

For heating largest soldering coppers, stenciling irons, branding irons, etc.; heat treating carbon steels, and soft metal melting. Lid on hood is removable for inserting 22 lb. pot for melting lead, tin, babbitt, etc. Three burners. Firebox  $6\frac{1}{4} \times 5 \times 6\frac{1}{2}$ . Complete with pot. \$35.00 F.O.B. factory.



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580 E AVENUE N.W. CEDAR RAPIDS, IOWA

## appointments . . .

York office. Lawrence S. Holbrook is service engineer at the Boston office. Also at the Boston branch is Robert Hemman, sales engineer. At Rockford, new service engineers are Scott R. Babcock and Clyde Person.

FRANK THOMPSON as north Texas territory manager for Cory Corp. For the past three years Mr. Thompson has been assistant territory manager for Chicago and northern Illinois.



Frank Thompson



J. A. Clarke

JEROME A. CLARKE as head of the sales training department of the Airtemp Div., Chrysler Corp. Mr. Clarke has been with the division since 1940. F. G. Hill has been named Kansas City regional manager. Jack G. Kehoe has been appointed manager of the Dayton sales region.



F. G. Hill



J. G. Kehoe

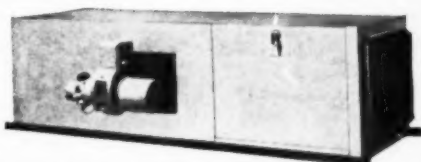
JOSEPH A. GRAZIER as acting president of American Radiator & Standard Sanitary Corp., to serve as the corporation's chief executive officer. Mr. Grazier was elected to this post at a special meeting of the board of directors. This action was taken because of the continued illness of Theodore E. Mueller, president of the corporation.

E. M. SWARTZ as vice president of the United States Radiator Corp. Mr. Swartz joined the company in 1935. In 1951 he was made general superintendent of steel plants. In his new capacity, Mr. Swartz will be responsible for supervision of manufacturing for the company's steel division.

ROY W. SIDBURY as district manager of the Baltimore branch of Chase Brass & Copper Co., Inc., a subsidiary of Kennecott Copper Corp. Mr. Sidbury has been with the company since 1936.

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### SUSPENDED Or Laydown Air Conditioning FURNACES



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It comes completely assembled including combustion chamber. For Garages, Service Stations, and Basementless Homes. Made in sizes from 75,000 BTU to 600,000 BTU.

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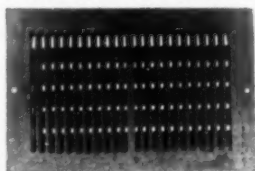
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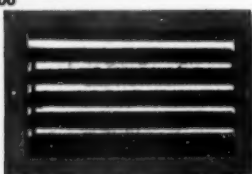


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Whether you are working on new construction or motorizing existing ventilators, Allen Exhaust Fans will be the top-performance, quality answer to the particular ventilating problem. Easy to install, economical to operate, these fans meet a wide range of needs. In addition to the Fan Section shown above, the line includes the Remote Drive Allen Staxauster, and for wall installations, the Allen Exhaust Fan and the Lo-Noiz-Level Multiblade Fan. Our representatives are in most principal cities; names listed in our catalog in Sweet's Architectural File, Section 20b.



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Specially designed for applications handling corrosives and/or high-temperature air.

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Will align gutter and square miters. Gutters may be joined at the eve as easily as on the ground.

Prevents expansion damage to gutter. The only satisfactory method for repairing gutter. Applicator guaranteed.

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## appointments . . .

LEON S. BUSH and W. H. Mitchell as representatives for The A. J. Nelson Co., mountain states sales representative for the Kramer Trenton Co. Mr. Bush will cover Utah, Idaho, western Montana and Arizona. Mr. Mitchell's territory includes Colorado, New Mexico, western South Dakota, western Nebraska, Wyoming, western Montana, and the city of El Paso, Texas.



L. S. Bush



W. H. Mitchell

NIEL N. DAHL as vice president of Harry F. Haldeman, Inc. Mr. Dahl was formerly chief engineer. He is a registered professional mechanical engineer in both Arizona and California.

VANDERSMITH'S HOME EQUIPMENT CENTER, Lancaster, Pa., as distributor for Westinghouse Air Conditioning Div., Westinghouse Electric Corp., to handle the compa-

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RECESSED WALL HEATERS

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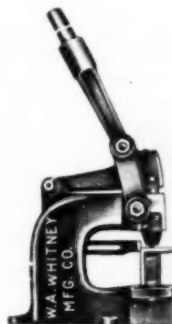
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Punches

Angle Iron  
2 1/2 x 2 1/2 x 1/4  
Channel Iron  
2 1/2 inch Flange x  
1/4 inch Web

Capacity

1/2 inch hole through  
1/4 inch iron, 3/4 inch  
hole through 3/16  
inch iron, 2 inch hole  
through 1/8 inch iron

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One hammer blow  
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EZ-ON Damper Controls are easily, quickly installed to save you time and money. EZ-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

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twist.

Handling the  
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No money tied up in idle equipment . . . And no time wasted in making adjustments . . . Fits any size ducts up to width of bender and any thickness up to 20 gauge mild steel.

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We can offer you a superior line of furnace fittings which will cut installation time to a minimum, and free your help for more jobs in less time.

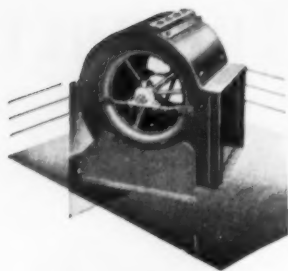
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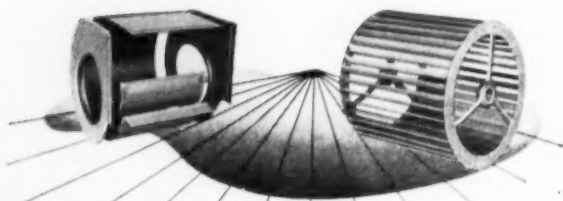
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Designed for manufacturers  
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Wheel Sizes 7 1/2" to 27"



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**The BISHOP & BABCOCK Mfg. Co.**  
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## appointments . . .

ny's packaged air conditioners. Albert E. Peters Co., Scranton, has been named distributor for the Sturtevant Div., to handle self-contained and field-assembled air conditioning equipment.

THOMAS A. BYRNES as sales manager, eastern division, and Gordon J. Duerr as sales manager, western and mid-western divisions, for the Imperial Brass Mfg. Co. Mr. Byrnes has been representing the company in the New York-New Jersey-eastern Pennsylvania area for many years. Mr. Duerr was previously western sales manager.



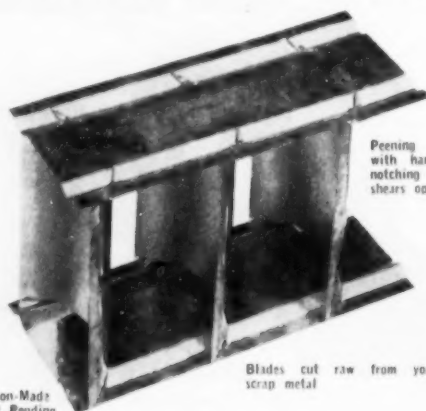
T. A. Byrnes



G. J. Duerr

THE ST. LOUIS AIR FILTER Sales & Service Co., St. Louis; Air Filter Sales & Service, Denver; Air Filter Sales and Service, Minneapolis; Air Filter Sales & Service Co., Jackson, Miss.; Air Filter Sales & Service Co., Nashville,

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Peening blades  
with hammer or  
notching with  
shears optional

Blades cut raw from your  
scrap metal

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NO PUNCHING NO SPOT-  
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### FOR SHEET-METAL WORK FOR THRU-WALL FLASHING

A non-rusting alloy of copper and zinc that costs about 40% less than copper, gauge for gauge. CHINC was tested by the Bureau of Standards—Approved by Federal Housing Authority—Accepted by U. S. Engineers—Millions of feet used all over the U. S. A. In three standard gauges.

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CHINC #10 (.012") equal in thickness to 10 oz. copper  
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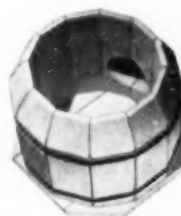
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for Boilers  
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4 Models — .75 to 3.0 GPH



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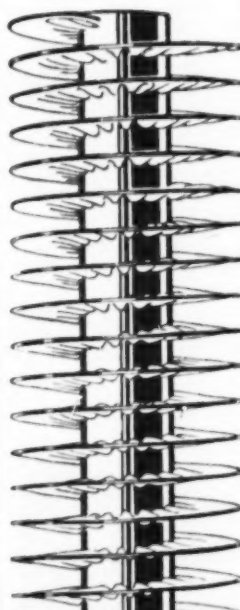
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Pat. Pending

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**Wa-Trol**

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## appointments . . .

Tenn.; and Dust Control, Inc., Hawthorne and San Diego, Calif., as sales and service representatives in their respective areas for the Farr Co.

WOLCOTT & ASSOCIATES, Los Angeles, as public relations counselors for Rheem Mfg. Co. B. Edward Soby, former southwestern regional sales representative for the plumbing and heating division of Rheem Mfg. Co., has been named assistant to the national advertising and sales promotion manager.



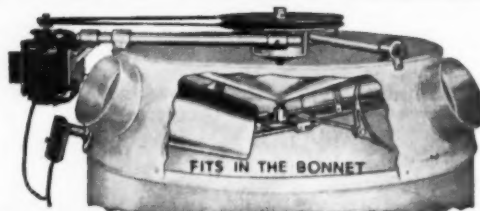
B. E. Soby



R. J. Hoover

RICHARD J. HOOVER as factory representative in the metropolitan Chicago area for Jackson & Church Co. He will handle the company's line of suspension and floor furnaces.

## Convert Gravity Furnaces With A CIRCULATAIRE Bonnet Blower



### CIRCULATAIRE ELIMINATES COLD ROOMS, BALANCES HEAT DISTRIBUTION, SAVES FUEL

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A COMPLETELY PACKAGED UNIT  
Nothing for the dealer to furnish except limited amount of labor.

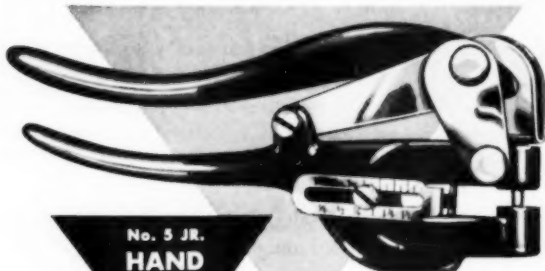


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METAL WORKING TOOLS  
FOR 43 YEARS



**No. 5 JR.  
HAND  
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UNIFORMITY OF  
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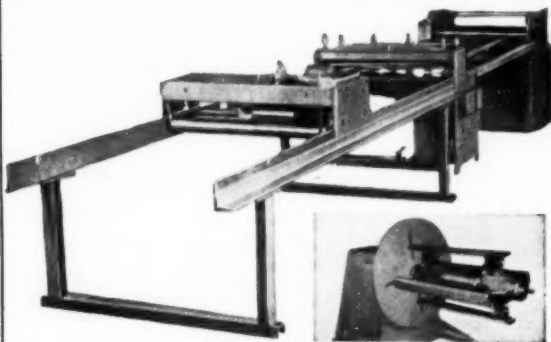
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- Lower material inventories
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The Right Angle**

... on any subject!  
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**The Right Angle  
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Available in  
All angles!

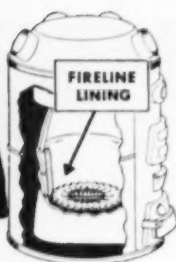


Available in  
All metals!

Available at  
most jobbers  
or write . . .

**GALVAN**  
*Manufacturing Co.*  
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**A better job!  
A bigger profit!**



**when you line firepots with**

## **FIRELINE**

### **Stove and Furnace Lining**

You can charge your customer less . . . give him a better firepot . . . and still make a longer percentage of profit when you use Fireline!

Yes, a better job because fireline gives the furnace owner a more durable, gas-tight lining that increases combustion efficiency by radiating heat clear across the fuel bed — not just in the middle as a casting does.

You can charge less because less time and material is required. There are no waits for replacement castings; no trouble with wrong sizes. Fireline goes in easily right through the firedoor without dismantling the furnace.

The ease of installation and freedom from trouble enables you to quote a lower price, yet make a longer profit . . . the kind of deal that makes everybody happy.

Fireline is packed in 50- and 100-lb. drums; 5- and 10-lb. cans. Stocked by leading jobbers everywhere.

### **FIRELINE STOVE & FURNACE CO.**

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**WRITE  
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FOR FREE  
SAMPLES**

Permanent aluminum soldering is made simple and easy with ALLEN Alumi-Soder. Complete in itself, flux and soder are combined in exactly the right proportion in a convenient "handy-to-use" stick



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## **appointments . . .**

ISHIER JACOBSON as manager of the Export Div., Connor Engineering Corp.

WILLIAM SIMONITE as sales manager for Lemlar Mfg. Co., manufacturers of aluminum louvers. Mr. Simonite is also in charge of the selling activities for the Lee Miller Co., sales organization in the southern California area for the parent company.

EDMUND P. HARRELL as sales representative in the western territory for Clayton & Lambert Mfg. Co.

JOHN J. MCGONAGLE as manager of steel sales for The Edgcomb Steel Corp. Previously, Mr. McGonagle was a sales representative for the company in Queens County, N. Y.

W. G. ADAIR and CHRISTIAN M. EBERSOLE as field service representatives handling room air conditioners in the south central states for the Air Conditioning Div., Remington Corp.

BROCK MOTT as Gulf Coast distributor of cooling systems and tubing for Drayer-Hanson, Inc. Mark Raymon has been appointed manufacturer's representative handling the company's air conditioning equipment in the state of

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BLOW PIPE ELBOW  
SAVES YOU MONEY**

- HOODS
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- FLOOR SWEEPS • BLAST GATES
- STAMPED AND ROLLED ANGLE RINGS

Cheaper and stronger than the ordinary pieced elbow, KIRK & BLUM'S One-Piece Elbows are rolled into a tube, then crimped on an exclusive machine to form a super tight, rigid elbow. These and other blow pipe parts, made in production quantities, are superior, cost less than the ordinary kind. Made in light to heavy gauges, from 3-inch to 14-inch diameter. Write for literature and prices.

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Ball Joints  
Any Size

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Painting Costs

1. More coverage per gallon
2. Easy, fast application
3. One coat covers
4. Faster setting-up time

Yes, 370 Special can save you money. Users report it covers more than five squares per gallon... sets up in 4 or 5 hours. It pleases your customers because it *really protects* against corrosion. Also available in green, blue, gray, brown and aluminum. ORDER 370 SPECIAL NOW FROM YOUR DISTRIBUTOR, or write for complete details and prices.

**THOMPSON & COMPANY**  
1805 Allegheny Ave., Oakmont, Pa.  
Established 1847



## ONLY THE TRADE-WIND CLIPPER

KITCHEN AND SMALL ROOM VENTILATORS

give you 5 quality features

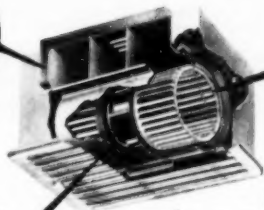
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CHANGEABLE  
DISCHARGE  
for easy  
installation

CENTRIFUGAL  
BLOWERS  
for quiet,  
powerful  
suction

DRIPLESS  
GRILLE  
for appearance  
and protection

ISOLATED  
MOTOR  
for clean,  
long lasting  
service

FIVE YEAR  
GUARANTEE  
insures top  
quality



MODEL 1201 100 C.F.M. for bath-rooms — time delay switch optional  
MODEL 1501 200 C.F.M. for average kitchens, laundries, dens.  
MODEL 2501 425 C.F.M. for large kitchens and other rooms up to 2000 cu. ft.  
MODEL 3501 550 C.F.M. for installation in cabinet over range. Hood optional.

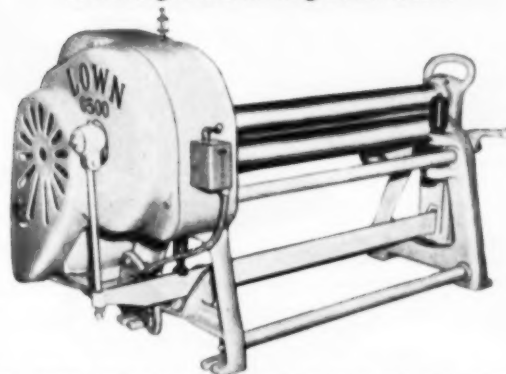
**TRADE-WIND**  
MOTORFANS, INC.

5717 SOUTH MAIN ST.

LOS ANGELES 37, CALIF.

AMERICAN ARTISAN, JULY 1953

## Another LOWN SLIP ROLL FORMING MACHINE New Model G-500 featuring Cone Rolling Attachment



Model G-550 Lown Slip Roll Former with 5" x 50" rolls, all power driven

A new improved modern design, engineered for durability, strength and service.

- Initial Pinch Type — Alemite Lubrication
- Capacity Model G-550, 8 - 10 gauge 4' wide. (Available in shorter or longer lengths)
- Quick Acting Latch on Drop Arm.
- Handwheel Adjustment of Rear Roll.
- Roll Position Indicators.
- Gear and Shaft Housing of rigid Unit construction.
- Fast, sturdy, easy to operate. Prompt Deliveries.
- Other machines with 2" to 9" dia. rolls also available.

Dealers in Principal Cities

Write for Bulletin—Mention this Ad

**SAN ANGELO FOUNDRY & MACHINE COMPANY**

BUILDERS OF BETTER ROLLS

1000 East Upton

San Angelo, Texas

## "FITRITE" and "RIVAL" ORNAMENTAL LEADING STRAPS



All styles also made in zinc.  
"Fitrite" 3" Jr. made in aluminum.  
All zinc straps can be used on aluminum and stainless steel (no electrolytic action).

SOLD THROUGH JOBBERS ONLY

Write for Folder and Free Samples

**RIVAL STRAP CORP.**

308 West 20th St.,

New York 11, N. Y.

## "FITRITE" 3-WAY CLAMP

A NEW VISE-GRIP MADE EXCLUSIVELY FOR US



Throat 3 1/4" deep  
Jaws 3 1/2" x 3/8"  
Designed for BOX  
LOCK of ventilation  
duct. Can be  
used as SHEET  
METAL CLAMP and  
as WELDING  
CLAMP.

PRICE \$3.55

IT LOCKS TO  
THE WORK

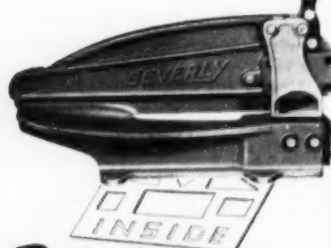
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NEW YORK 11, N. Y.

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Make any cut—curved, straight or irregular, faster, easier and better with less material waste on a Beverly Throatless Shear. You can turn work to any position and make a clean cut as you go. Handles heavy gauges with ease—lighter metals without distortion. 4 models—capacities 18 gauge to  $\frac{1}{16}$ " mild.



8-3 with  
Ball Bearing  
Hold Down



### INSIDE SLOTTER 8" Reach—16 ga. capacity

Makes inside slotting cutting faster, easier, cleaner. Punch and die arrangement of 5 blades assures accuracy, clean cutting action. Cuts  $2\frac{1}{2}$ " x  $\frac{1}{8}$ " or  $2\frac{1}{2}$ " x  $\frac{1}{16}$ " slot at one stroke. Throat design permits pivoting work at any point in stroke for special inside cuts. Note sample cuts at left.

See your Beverly Dealer or write for illustrated catalog.

**Beverly SHEAR MFG. CO.**  
3020 W. 111TH STREET • CHICAGO 43, ILLINOIS

## Special Notice!

AIR CONDITIONING SALES this year are expected to be greater than ever before. You will get a bigger share of this business by offering air-borne bacteria control through the nationally accepted Glycolator method.

Get an early lead by adding this low cost, profit-producing appliance to your line NOW! Write for complete information:

*Glycolator*, Dept. A-1, Valencia, Pa.



### ORNAMENTS STAMPINGS & SPINNINGS

Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.

If you don't have catalog K, send for it NOW.

**MILLER & DOING**

89 ADAMS STREET

BROOKLYN, N. Y.

## appointments . . .

Oregon. Harry Torch, Air-Rite Products Co. of Atlanta and Macon, Ga., will be representative in the Atlanta territory. Mel A. Disney will handle the sale of air conditioning products in the eastern part of Kansas and the western part of Missouri.

## Frederick E. Giesecke

DR. FREDERICK E. GIESECKE, New Braunfels, Tex., a past president of the American Society of Heating and Ventilating Engineers, died on June 27. He was 84 years old. An authority on heating and ventilating, Dr. Giesecke was a consulting engineer and Professor Emeritus at A. & M. College of Texas at the time of his death.

## Cyril Tasker

CYRIL TASKER, director of the research laboratory, American Society of Heating and Ventilating Engineers, died suddenly on May 27. Mr. Tasker had attended a meeting at Absecon, N. J., and was en route home when he succumbed to a heart attack in Warren, Ohio. He had been with the ASHVE since 1943 and previously for 13 years was a member of the staff of the Ontario Research Foundation.

## Big Time and Money Savers for YOU! LOCKFORMERS

- Cut Over-All Fabrication Costs in Half.
- Make Pittsburghs 15 Times as Fast as you Can Make them on a Hand Bending Brake.
- Pay for Themselves Quickly Out of the Extra Profits each one Earns.

ALL MODELS IN STOCK FOR  
IMMEDIATE DELIVERY!

Easy edgers and power flangers also available for immediate shipment.

- Send for illustrated folder and more information about this and other sheet metal working equipment.



## WARD MACHINERY CO.

561 W. WASHINGTON BLVD.

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## MILTON SHEET METAL MACHINERY SPECIALISTS

STOCK DELIVERY ON PEXTO, CHICAGO BRAKES, DIACRO, ROUSSELLE PRESSES, KIDDER, WHITNEY, ROTEX PUNCHES, REX WELDERS WE CARRY A COMPLETE STOCK OF NEW & USED HAND & POWER MACHINERY.

WE STOCK PUNCHES & DIES & ADAPTERS FOR ALL PRESSES & BRAKE DIES, SHEAR BLADES & SPOT WELDER-TIPS & HAND TOOLS.

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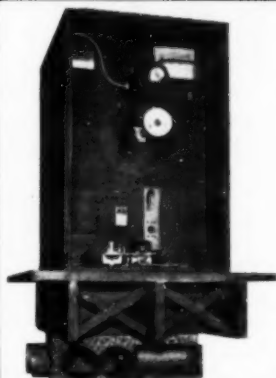
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Phila. 6, Pa.

WAlnut 2-1734

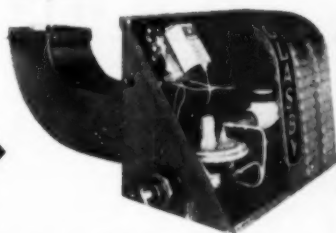


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**UPSIDE-DOWN FURNACE**  
Model #65 gas unit for basementless homes, (front panel removed). Plenum below floor or in concrete slab. 95,000 Btu's.

**GAS CONVERSION BURNER**  
Factory-assembled and tested. Push-button pilot lighter and safety switch. 2 models cover range 85,000 to 300,000 Btu's.



DEALERS, WRITE FOR INFORMATION ON OTHER FURNACES FOR SEMI-BASEMENT AND FULL BASEMENT HOMES

**J. P. GLASBY MFG. CO., INC.** 1 Montgomery St., Belleville, N.J.



## ADAMS Flue Thimble (Cast Iron)

Adams Cast Iron Flue Thimbles Insure Permanence, Tighter Fit, Better Draft.

Sizes 4 to 12 inches  
Buy Adams Known Quality

**THE ADAMS COMPANY**

Bridge Street • Established 1883 • Dubuque, Iowa

## BRAUER has

REPAIR PARTS for all FURNACES  
BOILERS, STOVES • *Guaranteed to FIT*

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MANUFACTURERS OF

## FURNACE PIPE AND FITTINGS, Prefabricated Ducts,



also conductor pipe, eaves  
trough, drip edge, rake strip, etc.

**THOR METAL PRODUCTS CO., INC.**

Box 118 Eastwood Station Syracuse, N. Y.

## FOR PERFECT SOLDERING

and GREATER PROFITS

In less time use Rubyfluid, the fast acting easy-to-use soldering flux that wets out freely, properly conditions metal for a strong union. No objectionable or harmful fumes. See your jobber or write direct for special \$1.00 offer.

**RUBY CHEMICAL CO.**

74 S. McDowell St. Columbus 8, Ohio



## Rubyfluid

## BB BLAST GATES



THESE BLAST GATES ARE DESIGNED FOR CLOSING OR PARTLY CLOSING PIPES SUPPLYING BLAST TO FURNACES, FORGES, BOILERS, Etc.; FOR USE IN EXHAUST OF BLAST PIPE SYSTEMS WHERE AIR IS TO BE REMOVED OR DIRECTED FROM ONE CHANNEL TO ANOTHER.

THE OPERATION IS SIMPLE BUT POSITIVE. SIMPLY PULL THE SLIDE BACK AND FORTH AS DESIRED. SLIDE CAN BE LOCKED IN ANY POSITION BY THUMB SCREW.

THE BODY OF THIS GATE IS CAST IRON, LACQUERED TO PREVENT RUSTING; THE SLIDE HEAVY STEEL.

MADE IN SIZES TO FIT PIPE 2 INCH TO 24 INCH INCLUSIVE.

WRITE FOR DATA SHEET.  
SOLD THROUGH LEADING JOBBERS  
EVERYWHERE

Manufactured by  
**BERGER BROS. COMPANY**

229-237 Arch Street Philadelphia 6, Pa.

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Rates for display space in the Service Section are \$10.00 per inch per insertion. One-inch minimum space accepted. Closing date — twentieth of the month preceding issue.



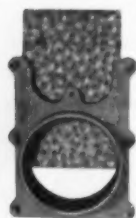
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LADDER SHOES**  
for safe climbing  
\$2.95 per pair  
**JOHNSON  
LADDER SHOE CO.**

Eau Claire, Wisconsin

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Registers and Grilles  
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Juniper Elbow Co. Inc.  
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**Cast  
Aluminum  
Blast Gates**

## FAST SERVICE ON DUST CONTROL PARTS

Cast Aluminum Blast Gates, sizes 3" to 8". Rolled Angle Rings, Floor Sweeps, 7 Gore Elbows, Exhausters. Prompt shipment. Write for prices and full information.

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## Quick Set Dividers



Fastest and most accurate on the market. Two sizes for circles up to 36" and 48". Guaranteed. Order now.

## CUT SOLDERING COSTS IN HALF

Will give you hot soldering iron in one minute—Solders eight hours for 10¢—Right amount of heat—No changing of irons—Make your own fuel from water and carbide.

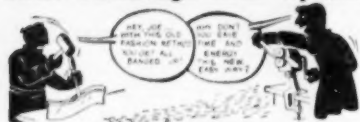


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Post Office Box 3035

Newark 5, N. J.

## Birks Pittsburgh Lock Opener



### OPENS

Curved Or Straight Sections

- Easy To Operate
- Increases Production
- Prevents Injury
- \$45.00 Complete
- F. O. B. Factory

**BIRKS MFG. CO.**

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**"... your  
time is money!"**

... so why should you waste it by looking around for items or personnel to make your organization more efficient? A simple classified advertisement

In American Artisan will turn the trick for you quickly and at low cost. No matter what you need, or have to sell, one of our readers will have it or want it.

Rates are shown on opposite page. closing date is the twentieth of the month preceding issue.

*Let's hear from you!*

# Manufacturers' Agents

*Are you interested in securing additional lines?*

We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their warm air heating, residential air conditioning and sheet metal products.

If you would like your name listed on our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

# AMERICAN ARTISAN

6 NORTH MICHIGAN AVENUE

CHICAGO 2

ILLINOIS

# SERVICE SECTION

## SHEET METAL MACHINES & TOOLS

Lockformer Pittsburgh Machines  
Lockformer Cleat Machines  
Chicago Hand Brakes  
Chicago Press Brakes  
Pexto Power Shears  
Pexto Foot Shears

Pexto Rotary Machines  
Pexto Slip Rolls  
Pexto Bar Folders  
Smith Cleat Benders  
Peer Spot Welders  
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When in Chicago, visit our Machinery Showroom

COMPLETE LINE OF SHEET METAL & VENTILATING SUPPLIES

SEND FOR  
NEW  
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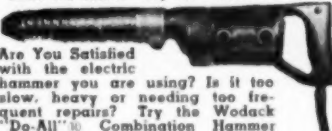
**CENTRAL-WEST MACHINERY CO.**

335 S. WESTERN AVE. CHICAGO 17, ILL.

PHONE: HAYmarket 1-0900

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DELIVERY  
AVAILABLE

A Better Electric Hammer  
Costs No More. Try It. You'll Like It.



Are You Satisfied with the electric hammer you are using? Is it too slow, heavy or needing too frequent repairs? Try the Wodack "Do-All" Combination Hammer and Drill. Strikes 2400 hard blows a minute, drilling concrete up to 3" a minute. Runs from lamp socket. Is changed to a 3/8" electric drill by opening the chuck and loosening the clamping screw. Preferred by many thousands of contractors and maintenance men. Get the facts. Ask for Bulletin 510-AA.

**Wodack Electric Tool Corp.**  
4627 W. Huron St., Chicago 44, Ill.

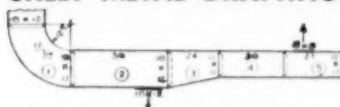
### FOLDING BRAKES

Easily forms angles, channels, Pittsburgh locks and all kinds of flanges, vees, arcs. Handles 24, 26, 28 gauge mild steel and heavier aluminum and copper. Can be bolted to bench or truck or on included, 32" high floor stand. All steel construction. Shipped Express or freight collect. 30" size, 95 lbs., \$35.50 36" 105 lbs., \$40.00 48" 135 lbs., \$55.00 100" size, 260 lbs., \$115.00 12" Press Brake. Fits in drill press, open ends, \$9.50.

Order direct cash or C.O.D., or send for folder

**VYKE BRAKE CO.,**  
T-3016 Leavenworth, Omaha 5, Nebr.

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A special service now permits you to prepare drawings at home at your leisure time for as little as \$5.00 per drawing project. This service is the result of the experience gained through an in-plant training program for sketchers conducted for one of the larger sheet metal contractors, and the training program now conducted at the National Technical Institute. You will work from actual mechanical blueprints and follow a step by step procedure in preparing the shop and field drawings of sheet systems quickly, accurately, and economically. Learn the new standards and procedures now being adopted in the sheet metal industry. Sketchers are becoming the key men in a rapidly expanding industry. Write for details.

**NATIONAL TECHNICAL INSTITUTE, 214 W. 23 St., N. Y. 11, N. Y. WA 4-7478**

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*Classified Section: Rates for classified advertising are 10 cents for each word, including heading and address. One inch \$5.00. Count seven words for keyed address. Minimum \$2.00 for each insertion. Cash must accompany order.*

**miscellaneous . . .**



**for sale . . .**

Established and going business — Roofing, Sheet Metal and Welding in fastest growing section of Florida West Coast. Shop equipment, trucks and stock included. You take over for \$6500.00 and keep it growing. Dunedin Metal & Roofing Service, Dunedin, Fla. Phone J. D. Goodson, 81-2552 or 81-3492.

12 Late type oil fired boilers designed for industrial use. GE Model LA54, complete with standard compressors; 2 DeGiers liquidometers. Big saving over original cost. Will sell piecemeal or collectively. Also included 2 heat exchangers in complete unit. Johnson Machinery Co., 683 Frelinghuysen Ave., Newark 5, N. J.

**situation open . . .**

We need an intelligent, aggressive man to assist us in appointing and servicing dealers for nationally known, widely advertised lines, in seven counties surrounding Dayton, Ohio. Commission and drawing account. Address Key 946, American Artisan, 6 No. Michigan Ave., Chicago 2, Ill.

**wanted . . .**

WANTED: Shearing any amount — all sizes. Galvanized, cold and hot rolled aluminum, stainless and copper 6" minimum width 56" minimum length, uniform quantities. Gauges from 16 to 30 inclusive.

Write or wire  
Los Angeles Sheet Metal Mfg. Co.  
901-905 East 9th Street, Los Angeles 21, Calif.  
Trinity 4713

the best reason for  
business paper advertising  
today

. . . is **tomorrow!**

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Keep your material inventory here  
**at Wolff Metal Service**  
 the sheet metalworker's warehouse

**GALVANIZED STEEL SHEETS**



**Complete stocks and same-day delivery give you a dependable, money-saving supply line**

Your material-on-hand file is in great shape when you use Wolff Metal Service as your stockroom. Take galvanized sheets as an example — something you need nearly every day.

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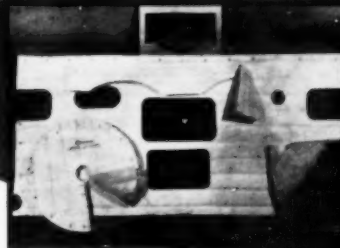
### Insulations

### Services

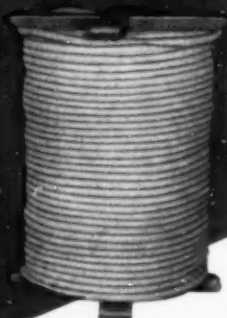
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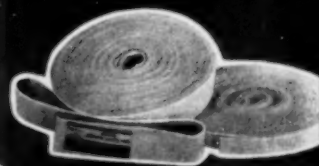
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Unarco facilities also are unexcelled for the production of asbestos textiles used in the manufacture or installation of all types of equipment . . . for caulking duct work, sealing joints . . . for insulating small steam lines . . . for every use requiring non-combustible cloth. The Unarco name is your assurance of highest quality.

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